

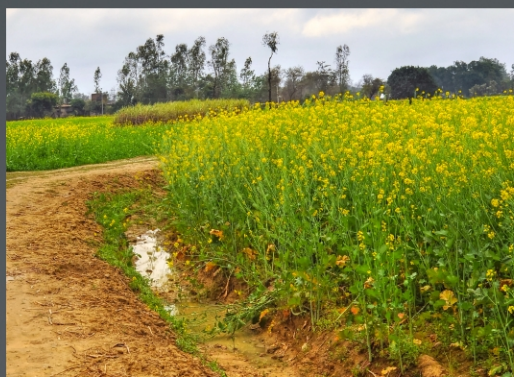
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CHANNELIZING CREDIT TO AGRICULTURE

Credit is one of the limiting factors in pursuing agriculture as a profession.
Access to cheaper and reliable credit holds the key to improving rural economy and agriculture.

BUDGET SPECIAL: THE PRO-AGRI BUDGET

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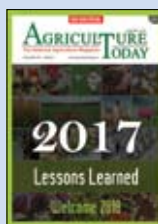
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From the Editor's Desk

INSTITUTIONALIZING AGRICULTURE CREDIT

Agriculture becoming capital intensive, the flow of rural credit has become increasingly pertinent for the success of agriculture. Unfortunately, the rural credit scene has been under the influence of money lenders for an unusually longer time. They still exert dominance in the rural settings despite the presence of other credit options.

Agriculture sector has seen a continuous flow of rural credit. Institutional credit to agriculture sector during the period between 1999-2000 and 2013-14, has witnessed an increase of almost 15 times. From this steady supply of credit, sadly a very small amount percolates to the largest category of farming population in India. The Input Survey, 2006-07 reveals that only 19.6 percent of the estimated operational holdings belonging to the marginal category of farming had found shelter in the institutional credit for agricultural purposes.

Union Budget 2018-19 made a huge thrust on agriculture and rural economy. The budget announced an increase in agricultural credit to Rs11 trillion. Pivotal announcements on MSP hike, linking markets and rural infrastructure were made.

Apart from the direct credit and indirect credit, credit support in the form of crop insurance, loan waivers and microfinance have also been supporting rural India. Crop insurance has also been able to extend the much needed financial aid to the farmers at times of distress and hence can be considered as an important source of rural credit. Pradhan Mantri Fasal Bima Yojana (PMFBY)-2016 has been the most recent version of crop insurance in the country. Loan waivers add an interesting dimension to the credit flow in agriculture. Derided and often relegated as a populist measure, the series of loan waivers have provided an instant relief to the farming community albeit at the expense of an ethical credit behavior. India faces a cumulative loan waiver of Rs 3.1 lakh crore (\$49.1 billion), or 2.6% of the country's gross domestic product (GDP) in 2016-17. Another phase in rural credit began with the introduction of micro finance. Microfinance constituted the provision of thrift, credit and other financial services and products of very small amounts to the poor enabling them to raise their income levels and improve living standards, operated through Self-Help Group (SHG)-bank Linkage (SBL) and Micro-Finance Institutions (MFIs).

While schemes galore at the national level to channelize the credit flow to rural strongholds, certain pockets remain unreachable. Debt traps have become far too common and farmer suicides have not seen any let down. There is no dearth of loans or schemes that extend financial assistance to the farmers. But somehow not all are benefited by this scheme. Money lenders still influence the farmers. The government should raise the awareness of the farmers and they should be made aware of the existence of such schemes. This will kill the unorganized sources of credit and expand institutionalization of rural credit.



Anjana

Anjana Nair

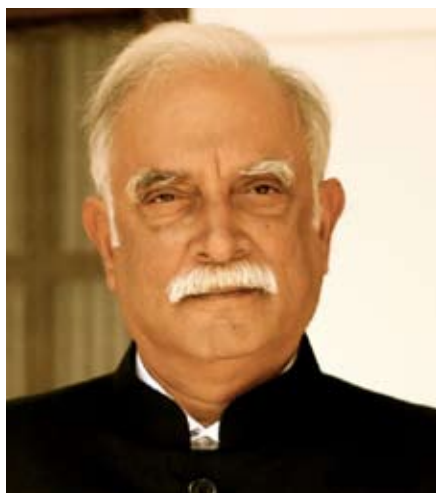
CONTENTS

VOLUME XXI | ISSUE 3 | MARCH 2018

Cover Feature



CHANNELIZING CREDIT TO AGRICULTURE



54

Know Your Leader

Ashok Gajapathi Raju Pusapati

Editorial	01
Editorial Comments	04
News Corner	08

Cover Feature	
Channelizing Credit to Agriculture	20

Budget Special	
The Pro-agri Budget	26

Farmer's Diary	
Pursuing the Passion	36

Opinion	
The CO2 Factor In Farming Soils	38

Technology Integration	
Sowing the seeds of a prosperous future for Indian farmers	40



International	
Uniqueness - The Strength of Kashmir Saffron	42

Enterprising Start ups	
Maple Orgtech (India) Limited - Converting Bacterial Waste to Useful Compost	46

ICT	
IoT & Food Block Chain for Post Harvest Food Supply Chain	48

Sustainable Agriculture	
Farmer's Income is Still A Zero - Sum Game	50

Know Your Leader	
Ashok Gajapathi Raju Pusapati	54

Different Strokes	56
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TRANSFORMING INDIA Through Agriculture



Use of fertilizer and green manure according to Soil Test Report



Insured crop under Crop Insurance



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Agriculture Flavoured Budget

The Union Budget 2018 makes quite an impression on Agriculture Sector

Agriculture sector emerged as the triumphant sector post budget presentation. In what is considered as the last budget of the Modi government, Finance Minister Arun Jaitley presented the most agriculture friendly budget of recent times handing goodies to the sector left and right.

This year's budget absolutely validated the government's objective of doubling farmers' income by 2022. Although every budget, since their ascension to power, bore the indications of working towards farmers' welfare, the quintessential reform that the sector was expecting for a long time, came through this year. Delivering on their poll promise FM announced increasing the MSP for all the unannounced crops of kharif one and half times of their production cost. Fixing higher MSPs will not automatically increase farmers' income and hence fool proof mechanism are expected to emerge from the Government to guarantee that this price reaches the farmer at any cost. Buying the produce from the farmer at this price may require well equipped infrastructure and most importantly a well oiled system of procurement and storage.

Agriculture markets form an integral part in agriculture value chain. Most often farmers are unable to realize their due profit due to irregularities in the market. Hence the decision of the government to upgrade and develop rural haats into Gramin Agricultural Markets (GrAMs), considering the limitations of the smaller farmers to engage with APMCS, is a welcome move. Also, the concept of Agri-Market Infrastructure Fund will also go a long way in securing a stable relationship of farmers with the organized way of marketing.

Small farmers and marginal farmers have influenced many decisions in this budget. The cluster approach can bring advantages of scales of operations and can help in augmenting the income prospects of the farmers. The move to establish cluster based development of agri-commodities and regions is accounts to an important step.

Another important beneficiary of this year's

budget is the food processing segment. The segment received a whopping amount of Rs.1400 crore in 2018-19, double the amount that was allocated last year. Another impressive development was the announcement of 'Operation Greens'. Operation Greens, has been launched to expand basic vegetables production - tomato, onion and potato – which have a constant consumption pattern and seasonal and regional production pattern.

Fisheries and Animal husbandry farmers were also able to grab the attention this budget. Apart from extending Kisan Credit Cards to them, the move to establish Fisheries and Aquaculture Infrastructure Development Fund (FAIDF) for fisheries sector and an Animal Husbandry Infrastructure Development Fund (AHIDF) for financing infrastructure requirement of animal husbandry sector will help in ushering in development in this segment.

Access to credit has been a main concern for the farmers especially the lessee cultivators. The intent to evolve a suitable mechanism to enable access of lessee cultivators to credit without compromising the rights of the land owners will be of great help.

For the first time, the budget has mentioned and addressed the pollution problem in the Delhi-NCR region. The special Scheme for Haryana, Punjab, Uttar Pradesh and the NCR of Delhi to address air pollution and to subsidize machinery required for in-situ management of crop residue has come as a relief.

Union Budget 2018 thus clearly lays emphasis on providing maximum livelihood opportunities in the rural areas by spending more on livelihood, agriculture and allied activities and construction of rural infrastructure. Agriculture received a major share of budget allocations. Many of the areas that were hitherto neglected, received a major boost in this budget. The entire budget had the collective agenda of increasing farmers' income and rural infrastructure. However, there seems to lack a clarity on how these funds will be utilized or how the historic MSP hike will be implemented on ground.

Time for Change

Increasing feminization needs a gender balanced approach in agriculture

The World Economic Forum's 2017 Global Gender Gap Report findings came out with a startling revelation that gender parity is over 200 years away. Gender parity remains distant and epochs away, and women continue to face discrimination in their workplace, society and family. Although movements like #MeToo and #TimesUp, have engendered a stronger and collective action towards a more gender inclusive world, it will take centuries to effect the same.

India too at the precipice of a change, has been battling gender inequalities. This year's economic survey painted eloquently in pink examined India's status of gender parity. Over the last 10-15 years, India's performance improved on 14 out of 17 indicators of women's agency, attitudes, and outcomes. On seven of them, the improvement has been such that India's situation is comparable to that of a cohort of countries after accounting for levels of development. The Survey encouragingly notes that gender outcomes exhibit a convergence pattern, improving with wealth to a greater extent in India than in similar countries so that even where it is lagging, it can expect to catch up over time. However, several other indicators, notably employment, use of reversible contraception, and son preference, India has some distance to traverse because development has not proved to be an antidote.

Although the Economic Survey had the courage to put forward the inequities faced by women, budget remained aloof and impractical to the women issues. The Euphoria over a pink Economic Survey died a natural death with the arrival of Budget which swiftly and casually glossed over the plight of women in India and assuaged their wounds with gas connections and provisions for loans. Nothing that validated the existence of women farmers or the ones that encouraged feminization in Agriculture made their mark in the budget.

Indian agriculture on the contrary is experiencing widespread feminization. With growing rural to urban migration of men, women left behind has taken up farming. Women are increasingly donning multiple roles of cultivators, entrepreneurs and labourers. Women,

world over has a quintessential role in ensuring food security and preserving local agro-biodiversity. But still their access to resources like land, water, credit, technology and training remains limited, as apparently they are not the true owners of land. The patriarchy has reduced their status to that of mere workers in their own family land.

The government continues to earmark schemes to mainstream the women farmers. However, due to existing ambiguities regarding the female ownership of land or the absence of their names in sarkari data systems, these schemes have little use to the women farmers. Most of the subsidies earmarked for availing different inputs are denied to the women in agriculture. So also their claims for crop loss due to climate changes. According to Census 2011, out of the total women workforce, 55 per cent are agricultural labourers and 24 percent are cultivators, while they own only 12.8 per cent of the operational holdings. This, despite the Hindu Succession Act of 1956 which prescribes equal distribution of property among all inheritors, irrespective of gender. The women who toil in the field are hardly compensated for the hard work as they are paid less than the men. Sixty percent of all agricultural operations are handled exclusively by women, while hourly wage rates in agriculture vary from 50 to 75% of that of men.

India needs immediate efforts to mainstream women farmers. The increasing presence of women in agriculture warrants a change in our policy and technology front. Special subsidies or better subsidies for farms that are headed or co-owned by women farmers can make a significant difference in their status. This will ensure timely support to them in carrying out farm operations. Gender sensitive farm mechanization is another area where India can make a marked difference. The country is slowly nudging towards farm mechanization and this is the right time to introduce machines that are women friendly. This year's Women's day campaign is to press for change. It becomes all the more important for Indian agriculture, which is seeing an increase in number of women participation. We need just more than a pink book.

Compensating the losses

MP's deficit price payment scheme can further distort the market balance

Madhya Pradesh's Mukhya Mantri Bhavantar Bhugtaan Yojana or Chief Minister's deficit-price payment scheme has been siphoning off the anger that had accumulated among the farmers in the state last year. The slump in prices had resulted in widespread protests and unrest in the farming community. The unbridled anger and resentment that led to farmer protests and death of farmers in riot has precipitated into this simple policy under which the government bears the loss and farmers are adequately compensated.

The scheme puts less pressure on the government machinery. Under the scheme, the government does not procure the produce from farmers. Instead, when prices fall below the minimum support price (MSP), the government pays the difference between the MSP and a modal rate worked out by taking the average of selling price in mandis in three states over a fixed period. Nearly 10.5 lakh farmers have registered themselves under the scheme for kharif crops and have sold 28.3 lakh MT of produce, including soybean, moong, til, ramtil, arhar and maize. The scheme was introduced in October last year, four months after farmer unrest claimed six lives. The scheme has further been extended this year to include rabi crops such as chana, mustard, lentil and the infamous onion.

The scheme offers relatively an easier pathway for both farmers and the government. In the MSP driven procurement system which was also the norm in Madhya Pradesh till BBY was introduced, the government had the onus to procure the products from the farmers at the MSP declared by the centre. Their responsibility also extended to storage and further distribution. However, in practice, wheat and paddy, were the only ones which were procured in a significant scale as they were channelled into the Public Distribution System. The procurement was also mired in

controversy owing to unexplained leakages and pilferage. For many other commodities, the procurement has not been possible. The situation was in need of an overhaul.

The new system, evolved by the MP government vindicates the government from the responsibility of procurement. Instead, their involvement is limited to partly compensating the farmer for the difference between the prevailing market prices and the minimum support price it declares. The farmers need to register for the scheme and sell their produce at registered agricultural markets. The difference would be credited to their respective bank accounts. The system offers momentary relief to the farmers. The government's involvement is minimal and the relief is instantaneous. This probably explains the interest of other states and governments in the scheme. Unlike other schemes which take months or sometimes years to reflect the results, this system is prompt and immediate. Schemes like this comes in handy to impress upon the electorate, when elections are imminent, and the political parties are in need of a miracle.

The simple architecture of this plan obviously had overlooked some other probable shortcomings. Farmers have already started witnessing an artificially induced slump in prices and they have accused traders of purposefully depressing the prices. MSPs have become a hypothetical price instrument, as market prices are perennially lower than MSPs and completely at the disposal of the trader. The idea of compensating for the losses suffered by the farmer at the hands of the traders are further fuelling distortions. The government as a responsible body should treat the farmers' distress as a symptom and not as the problem itself, and the solutions should be directed at the root cause and not at the symptom. The quick fix measures can mask the symptoms for a while, in the meantime exacerbating the root cause. What we need is realistic solution and not quick fixes.

MSP Drama

MSP increment in the budget loses sheen

Union Budget 2018-19 was a make or break deal for the Modi government. Being the last in this term, the budget carried the burden of extending the last tranche of goodness to the vote bank. As expected the budget appeased to the larger populace, the farmers and most importantly the rural segment who received the bulk of the allocations.

The much touted and widely appreciated aspect in this budget was the announcement by the Finance Minister of increasing the MSP by 1.5 times of the production cost of agriculture commodities. Although the FM failed to give any further details during budget presentation, the euphoria generated gave the momentary impression that it resonated the National Commission on Farmers's proposal. But in the communication that ensued, the real formula was revealed and led to the realization that the 'higher MSPs' are nowhere near to what NCF had prescribed. The FM's renewed MSP will be based on the A2 + FL costs, and not the more ambitious C2 costs formula favoured by farm scientist, MS Swaminathan.

For calculating production cost, two broad concepts — Cost A2 and Cost C2 — are relied upon. Cost A2 includes all expenses paid by the farmer in cash or kind such as seed, fertilizer, farmyard manure, pesticides, hired labour, machine labour and irrigation and maintenance costs. It also includes rent paid for leased-in land, depreciation of assets, interest on the working capital and the imputed cost of owned seed, farmyard manure and machine labour. Cost C2 is calculated by adding to Cost A2 the imputed cost of family labour, the interest on fixed capital and the rental value of owned land. Dr. M.S. Swaminathan, in his report submitted to the Central government in 2006, recommended that MSP be based on production cost (C2 cost) plus a 50% margin.

Although this budget has quite flamboyantly

suggested the introduction of higher MSPs as a first of a kind initiative by any government, this is not exactly the case. Even in the last year of the UPA, in 2013-14, MSPs for all rabi crops were way above 50% margin over Cost A2 + FL. For example, in wheat, the margin was 106%, and in rapeseed-mustard 133%. For the current year of the NDA, the margins are 112% for wheat and only 88% for rapeseed-mustard. And this has been more or less the same for more than 10 years.

The election promise of 50% margin over cost was in fact based on the more comprehensive C2 cost and if implemented would have required massive increases in MSPs and would have been quite impractical from the point of view of execution for the government. So in this budget, the reference cost was changed quietly from C2 to A2 + FL, all the while withholding the identity of cost on which the computations would be made. The government was able to successfully create the impression that they had fulfilled its election promise.

But the real question is whether the MSPs were able to increase the farmers' income over the years. The benefit from MSPs would emerge only if the farmers get access to these prices. Government backed procurement system has so far worked only in few commodities and few states. Most of the farmers are ignorant of the MSPs and they continue to survive in the depressed market prices. More than eighty percent of the farmers belong to small and marginal categories who hardly benefit from MSPs. So whose incomes are we intending to increase?

Through this exercise, the government might have earned some brownie points which it considers to spend in the imminent election campaign. Unfortunately, the benefit of this proclamation limits to that itself. If the real benefit of the farmer is the objective of the government, then they have to shun these theatrics and embark on something more realistic and substantial.

AP issues notice to Nuziveedu, Kaveri for HT cotton seed use

Even as sales of herbicide-tolerant (HT) cotton seeds are being reported from across the country, the Andhra Pradesh government has served show-cause notices on Nuziveedu Seeds Limited and Kaveri Seeds for reported use of the illegal gene in some of their seed samples. The State's Additional Director of Agriculture (Seeds) has asked the two companies to explain why, having violated regulatory protocols, the government should not cancel their licence to sell the seeds. The report cited investigations by a taskforce, which was set up to look into alleged violations in a few villages in Guntur and Kurnool districts in October 2017. Along with Telangana, Gujarat and Maharashtra, AP has widespread plantations of HT cotton, which is the third-generation cotton seeds technology developed by Monsanto. In fact, a third of the 45 lakh acres of cotton area in Telangana is under illegal HT cultivation. The Roundup Ready Flex contains a third gene (CP4-EPSPS) that imparts herbicide tolerance to the plant. When herbicide



is sprayed on the crop, it kills the worms, while the plant, protected by the gene, can withstand the chemical. "It doesn't have the Genetic Engineering Approval Committee (GEAC) permission for commercial release of the technology and is hence illegal and unapproved," the notice observed. NSL contended that the government's charge

was baseless and "bad in law". "The samples mentioned in the notice are neither collected from our company premises, offices or fields nor [were they obtained] from our distributors or dealers," a company executive said. Mahyco- Monsanto Biotech Ltd (MMBL) said it will cooperate with the investigation.

Crystal Crop to acquire Solvay's manufacturing facility in Nagpur

Delhi-based agro-chemicals firm Crystal Crop Protection Pvt. Ltd (CCPPL) said it agreed to acquire a speciality chemicals plant from Cytec India Specialty Chemicals & Materials Pvt. Ltd, an Indian unit of Belgian chemicals firm Solvay SA. The manufacturing facility spread across about 10 acres of land is located in Butibori, Nagpur, Crystal Crop said in a statement. Cytec Industries Inc. was acquired by Solvay SA in 2015 for \$5.5 billion. Brussels-based Solvay is a multi-specialty chemicals company with operations in 58 countries. Singhi Advisors, a Mumbai-based investment bank focussing on niche mergers and acquisitions (M&As), was the sole adviser to Solvay Group in the transaction. This is the second transaction of Singhi Advisors with Solvay in India in this year. Crystal Crop Protection, founded in 1994 by Nand Kishore Aggarwal, is engaged in technical manufacturing, formulation and marketing of agrochemical products like insecticides, fungicides, herbicides and plant growth regulators/micronutrients. The company has manufacturing units—two in Haryana, one in Jammu and one in Hyderabad. Crystal Crop has recently diversified into the seeds and agri-equipment businesses. It has also set up a research and

development (R&D) centre focusing on molecule synthesis, formulations research, process development and bio-efficacy testing. Crystal Crop Protection has made a number of acquisitions in the past few years. In 2011, it acquired Hyderabad-based Rohini Seeds, marking its foray into the seeds segment. In 2016, it acquired fungicide brand 'Bavistin' from Germany-based BASF, which has a market of size of more than Rs100 crore, according to the company. In 2012, the company raised funding from private equity firm Everstone Capital, which invested about \$30 million for a 9% stake. Mint reported in May last year that Crystal Crop Protection had begun preparations to launch an initial public offering in early 2018 to raise funds for expansion. The agrochemical sector has seen a number of investments in the past few years. In 2016, Japanese conglomerate Sumitomo Chemical Co. Ltd acquired a majority stake in Mumbai-based Excel Crop. Care Ltd for \$62.4 million. In 2015, Zuari Agro Chemicals Ltd acquired a controlling stake in UB Group firm Mangalore Chemicals and Fertilizers Ltd for \$64.5 million. Also in 2015, Godrej Agrovet Ltd, a subsidiary of Godrej Industries Ltd, raised its holding to 52.28% in agrochemicals maker Astec LifeSciences Ltd.

Warren Tea, Dhunseri vie for Assam Co

India's oldest surviving and perhaps the most prized tea company (in terms of its assets) is set to go under the hammer. Even before the information memorandum has been circulated, the 179-year old Assam Co. India Ltd has several suitors: MK Shah Exports Ltd, Warren Tea Ltd and the Dhunseri Group to name a few. Assam Co. has 14 tea estates. "The produce of some of these estates is unique—you cannot produce such tea anywhere else in the world," said the chairman of a potential bidder, who asked not to be named. There's going to be "intense competition" for Assam Co., this person added. Assam Co. owes around Rs1,800 crore, including penal interest, to its financial creditors, or lenders, and it is currently going through insolvency resolution under the supervision of the Guwahati bench of the National Company Law Tribunal (NCLT). Kannan Tiruvengadam, the NCLT-appointed resolution professional, said bids for the company's asset will be invited by the end of February or early March. Even Srei Infrastructure Finance Ltd, one of Assam Co.'s creditors, which moved the NCLT last year, is likely to bid for the assets though it does not have any experience in running plantations, according to a person familiar with its plans, who, too, asked not to be named. Asked about Srei's plans for Assam Co., a spokesperson for the lender declined to comment.



Indian firms tasting success in East Africa

A Kerala-based spices company recently started growing chillies in Rwanda, which is estimated to have increased the income of farmers there six-fold. A leather company from Tamil Nadu has set up a plant in Uganda producing one million pairs of shoes annually and is generating new jobs in both countries. And, 300 Ethiopian artists are getting handloom and handicrafts training in Bengaluru. These are just a few of the success stories that have been spun over the past two-three years by Geneva-based development agency International Trade Centre's initiative — 'Supporting Indian Trade and Investment for Africa' (SITA). "We are looking at mid-sized companies which have less of a natural inclination to look abroad. Through the SITA initiative we are building bridges between India and East Africa by taking Indian companies to these countries to see with their own eyes what the opportunities are," said ITC Executive Director Arancha Gonzalez. Investment flows worth \$71 million and additional trade flows of \$26.5 million have so far been generated between India and East Africa (with an additional \$10 million in the pipeline) as part of the six-year project (2014-2020) funded by the UK's Department of International Development.

Mpeda in pact with Switzerland's COOP for organic aqua farming

To cater to the growing demand for organic seafood products across the European Union, COOP Cooperative — one of Switzerland's biggest retail and wholesale companies — has partnered with the Marine Products Export Development Authority (Mpeda) to develop export-oriented organic aqua farming in India. Mpeda will assist in identifying entrepreneurs and providing them with technical advice on the production of high-quality organic shrimp that meet national and international certification protocols. COOP, which today has nearly 2,200 sales outlets throughout Switzerland and wholesale/production business across Europe, has offered to procure the processed organic shrimp at a premium of up to 15 per cent and with an additional 5 per cent through financing for development activities, including training. The pilot project will be run in Kerala to produce organic black tiger shrimp (*Penaeus monodon*) initially in 1,000 hectares, and if successful, extended to other locations across the country. According to A Jayathilak, Chairman, Mpeda, there is an increased awareness across Europe about organic produce



and it constitutes a niche market. The reason why many farmers are hesitant to get into organic production is the increased costs involved. The premium price offered will offset the extra cost and incentivise them to explore organic farming. Mpeda and COOP will facilitate the certification of a shrimp hatchery for the production of organic shrimp seed and similarly certify and empanel a small scale feed mill unit to source the organic feed for the project. Gerard Zurlutter, Member of Management, COOP, said India would be their second leg in organic farming after Vietnam, where they have had success with similar projects and organic producers who are generating considerably higher revenues than conventional farmers.

No upper limit to durations of contract farming, says panel

➤ The government is planning to allow companies time flexibility to pool farmers' land for the long term in accordance with new contract-farming guidelines, currently being drafted by a committee. This committee is headed by Ashok Dalwai, chief executive officer, National Rainfed Area Authority (NRAA), Union Ministry of Agriculture. Introduced first in December last year, the model draft guidelines on contract farming, to be incorporated into the State/Union Territory Agricultural Produce and Livestock Contract Farming (Promotion & Facilitation) Act, 2018, have provisions for companies to pool farmers' land for at least one season and a maximum of five. Stakeholders in the farming sector have suggested the maximum time limit be done away with. "We have received recommendations from various stakeholders to remove this periodic limit. In the revised guidelines, to be introduced in March, there will be no mention of limits. We would like corporates to ensure farmers



better realisation of their produce. The new contract farming guidelines would enable corporates to set prices in advance, i.e. forward contract, and take responsibility for quality, handling, transportation, and marketing of farm produce," said S K Singh, deputy agricultural marketing adviser and member-secretary of the committee. Plants like pineapple and palm start yielding fruit after three-four years of sapling. With the high gestation period, neither companies nor farmers have evinced an interest in

this. That's why palm plantation never succeeded in India despite incentives announced by the government. Prices set in forward contracts should not be less than the minimum support prices for a number of farm commodities, the committee has suggested. In the process, however, the Centre is planning to pull out "contract farming" from the Agricultural Produce Markets Committee Act to promote processing fresh agriculture produce and exports of value-added products.

Centre hikes import duty on sugar to 100%

➤ The Centre has raised the import duty on sugar to 100 per cent from 50 per cent, and on chana to 40 per cent from 30 per cent, in a bid to curb a fall in prices of these commodities. Chana futures on the National Commodity and Derivatives Exchange rose over 1 per cent on the news. While trading in sugar futures has been negligible due to low volumes for the past few months, spot prices rose in key wholesale markets following the hike in import duty. The Centre had, in December, imposed 30 per cent duty on chana imports to restrict the fall in domestic prices. The bearish sentiment in the chana market, however, had continued due to the expectation of a bumper output this Rabi season at a time when supplies from last season are already high. The hike in import duty on chana will restrict purchases, boost domestic prices and safeguard the interests of farmers, traders said. For sugar, apart from the fall in prices, there were also concerns over cheaper imports from Pakistan through the Wagah border.



Govt scraps floor price for onion exports

➤ The government said in a notification that it has scrapped minimum export price on onions till further orders. Previously, a floor price of \$700 per tonne on onion exports was in place till February 20. In November, the government imposed minimum export price of \$850 on the bulb till December 30, after shortage of the commodity led to a sharp rise in domestic prices. The export curb was later extended to January 20 and then to February 20, albeit with a cut of \$150. In the Budget presented on Thursday, the Finance Minister said that to realise the potential, farm exports — estimated at \$100 billion — will be liberalised. Onion supply in the country had declined earlier due to poor kharif crop, which had resulted in a spike in prices. Prices of the bulb, which were on a rise since July, had touched a two-year high of Rs 3,700 a quintal in December. Prices, however, started tumbling thereon with an increase in arrivals, easing prices of the vegetable. Onion prices touched a four-month low in the benchmark market of Lasalgaon in Maharashtra recently due to an increase in local supplies. The vegetable was sold at an average price of Rs 2,150/quintal, the lowest level seen since October, data from the National Horticultural Research and Development Federation showed.

Govt imposes stockholding limits for sugar mills

➤ In the wake of falling sugar prices, the Centre capped the quantity of sugar that mills can release in the market in February and March. The order comes days after the government hiked import duty on sugar to 100 per cent mainly to check shipments from Pakistan, which gives subsidies to exporters. According to the new notification, sugar mills have to hold, at the end of February, 83 per cent of sugar stock they had by 31 January and at end of March, retain 86 per cent of the stock they had on February 28, the notification said. The move is expected to arrest a glut in the market, which would otherwise lead to further plummeting of sugar prices. According to an industry source, sugar is currently retailing at 6 to 7, lower than the ex-mill gate price and the mills are already piling up losses. Sugar production in the current sugar season 2017-18, beginning November last year, is projected to be 25.1 million tonnes, 30 per cent higher than the previous season.



Centre plans to build rice silos in main growing states

➤ The government will construct high-tech silos for storage of rice in producing states once the technology for the same is fully ready. At present, pilot projects for rice silos have been undertaken by state-owned Food Corporation of India (FCI) at Kaimur and Buxar in Bihar to test the technology. The West Bengal government has evinced interest for construction of rise silos when the technology for the same is finalised. Once the technology is established, the central government would like to construct in West Bengal and other rice producing states. The construction of silos for wheat is underway. The FCI has awarded contracts to operators for construction of wheat silos with a capacity of 2.5 lakh tonnes at six places in Punjab, Delhi, Bihar, Assam and Karnataka. A storage capacity of 25,000 tonnes at Kotkapura in Punjab has been completed in 2017-18 while construction work is in progress in the remaining locations. Further, Central Warehousing Corporation (CWC) has also initiated construction of silos of 50,000 tonnes capacity at Nabha in Punjab. Punjab has also planned to construct silos of 17 lakh tonnes capacity, of which work for 1.5-lakh-tonne capacity is completed while construction of another 15.5 lakh tonnes by the state agency is underway.

Govt may launch Rs 500 crore market assurance scheme to help farmers

➤ The government is planning to launch 'Market Assurance Scheme' with a corpus fund of Rs 500 crore under which states will procure crops if prices fall below the minimum support price (MSP), according to sources. The proposed scheme will strengthen procurement and ensure farmers do not suffer from marketing inefficiencies. A concept paper in this regard has been finalised by the agriculture ministry in consultation with states and union territories (UTs), they said. As per the proposal, the ownership of the Market Assurance Scheme (MAS), including the decision to procure at MSP, and its actual operation will be vested with states. States will procure crops (except wheat and paddy) at the MSP, as notified by the Government of India, if prices fall below it. Keeping in view the limitation of financial resources with states and procuring agencies, the government is planning to initially create a central corpus fund of Rs 500 crore for providing interest free advances towards working capital to states to enable them make revolving fund at state level. States will decide when to begin procurement and enter the market and start procurement through their own public sector agencies or through other empanelled or authorised private agencies or central procuring agencies. States will be responsible to deal with and dispose of the procured commodities in an appropriate manner. However, losses if any incurred in these operations by the states will be compensated by the central government up to a maximum value of 40 per cent of the MSP.

Plantation staff can buy subsidised fertilizers

➤ The Ministry of Chemicals and Fertilizers clarified that registered companies and partnership firms engaged in plantation work can authorise any of their employees to purchase subsidised fertilizers. The clarification said the employee can purchase any specified quantity and type of subsidised fertilizers on behalf of the company using his or her Aadhaar number and produce the authorisation letter at the retail outlet at the time of purchase. However, a plantation sector source said this might not benefit the plantations as they cannot take GST input credit on fertilizers if an employee purchases it in his or her name.

Gir's Kesar to give tough fight to UP's Dussheri

➤ In a first-of-its-kind move, Kesar mango farmers from Talala taluka in Junagadh are all set to directly sell their famed produce in Delhi and also explore possibilities of marketing it in other states across the country. Uttar Pradesh's Dussheri mangoes, which has a huge market in Delhi will get tough competition this year from Gujarat's Kesar mangoes. Over 300 farmers have come under the banner of Gir Krishi Vasant Utpadak Sangh (GKVUS) and begun the process of developing a logo and registering the trademark for Kesar mangoes. Since last couple of years the Talala farmers have been selling mangoes directly only in Ahmedabad. The luscious Kesar, largely grown around the foothills of Girnar mountains in Junagadh, has attained global recognition as 'Gir Kesar' mango after receiving the Geographical Indication (GI) tag. Kesar is the second variety of mango in India to get GI tag after the Dussheri variety grown in Uttar Pradesh. In 2015-16, mango production in Gujarat was 12.41 lakh tonne, of which nearly 2 lakh tonne was estimated to be of Kesar mangoes grown in Junagadh, Gir-Somnath and Amreli districts. The Kesar mangoes are cultivated in 20,000 hectare area and its peak season starts from April. In May this year, around 30 farmers from Talala will be going to Delhi to sell Kesar mangoes under the banner GKVUS which is registered as Farmers Producers Organization (FPO). A state-level autonomous company Gujarat Agribusiness Consortium Producers Company Ltd (GUJPRO) will provide the platform for farmers in Delhi and help them market the mangoes in association with the Small Farmers Agribusiness Consortium (SFAC), a firm promoted by the central government.

Straw management now mandatory in Punjab

➤ In an attempt to check the dangerous trend of stubble burning, the Punjab government has decided to make attachment of super straw management system to combine harvester machines mandatory while harvesting the paddy (rice) crop. "These instructions are aimed at saving the environment from air pollution caused by stubble burning," said Punjab Pollution Control Board chairman K.S. Pannu, adding that the owners of combine harvesters desirous of undertaking the harvesting of paddy in the State would now have to attach super straw management system with the harvester combine. "We have also instructed that no harvester combine shall be allowed to harvest paddy in Punjab without a functional super straw management system," said Mr. Pannu. He added that the instructions have been issued under section 31 A of the Air (Prevention and Control of Pollution) Act, 1981. Mr. Pannu said that Punjab has been declared air pollution control area. "Punjab Agricultural University, Ludhiana, has also recommended that super straw management system be attached to self-propelled combine harvesters, which cuts the paddy straw into small pieces and spread the same. With this method, farmers are not required to burn paddy straw before sowing the next crop," he said.



Wheat crop faces weather setback in Madhya Pradesh and Gujarat

➤ Hailstorm in the past few days in central and western India has created uncertainties for the wheat crop and quality even as the bonus announcement by the Madhya Pradesh (MP) has raised concerns about similar demands coming from other states. It has been estimated that 97.5 million tonnes (98.38 million tonnes last year) of wheat will be produced in the country, and this could be a bumper crop. It was expected to touch 100 million tonnes. Chilly weather later in the season is good for wheat but the hailstorm proved to be a dampener. As a result, the "quality of wheat which arrives early in MP and Gujarat will be affected and despite the better-quality wheat sown in these regions farmers will not benefit", a trade analyst said. The Union food ministry has called a meeting on Thursday to chalk out grain procurement strategies, by which a target for wheat procurement may also be set. Food Corporation of India will start procurement after a month but farmers in MP have started selling early wheat despite the state declaring a bonus of Rs 200 per quintal for the 2018 rabi season. It is likely that the price deficit or the bhavantar scheme may be applied to wheat and procurement may remain low in MP, according to trade circles. Flour mills are, hence, on a stronger wicket because they will continue to get wheat of the quality they need for milling.

Tomato, potato processing units for Solan, Kullu

➤ Agriculture, Tribal Development and Information Technology Minister Ramlal Markanda today said tomato and potato processing units would be opened in Solan and Kullu soon. He said both districts were the leading producers of these crops. The opening of such units would give an apt value to the agrarian produce and help perk up the economy of farmers. This would also ensure employment and self-employment opportunities for the youth, he added. Addressing mediapersons, the minister said all 19 mandis of the state would be equipped with appropriate infrastructure and these would be linked to the online national agriculture markets. He said 9.87 lakh farmers would be provided the Pradhan Mantri Crop Insurance Scheme. At present, only 1.14 lakh farmers were linked to this scheme. The minister said Rs 1 crore was being spent on upgrading facilities at the Parwanoo mandi so that marketing activities would be carried out throughout the year. Markanda Solan and Kullu districts are the leading producers of these crops. This will also ensure employment opportunities. All 19 mandis will be linked to the online national agriculture markets.



MP Govt offers sops for farmers, incentive on MSP for crops

➤ Madhya Pradesh Chief Minister Shivraj Singh Chouhan announced several measures under the “Chief Minister Agriculture Productivity Scheme” to ensure farmers get fair prices for their produce. “Under this scheme farmers will be given Rs 200 per quintal incentive in the support price for wheat and paddy crops. Prime Minister Narendra Modi has announced a support price of Rs 1,735 per quintal for wheat. After adding this incentive to it, it will be about Rs 2,000 per quintal,” Chouhan announced while addressing a convention of farmers. He said a bonus amount of Rs 200 per quintal would also be given on paddy next year. The CM said that e-procurement of 67.25 lakh metric tonnes of wheat on support price was made in the Rabi season of 2016-17, and Rs 1,340 crore was paid to 7.38 lakh farmers. Similarly, the state e-procured 16.59 lakh metric tonnes of paddy on support price in Kharif 2017 and Rs 330 crore would be paid to 2.83 lakh farmers, he said. The chief minister also announced that gram, masoor and mustard crops would be included in the Bhavantar Bhugtan Yojana in 2017-18 and onion in 2018-19. Chouhan also announced a slew of measures for farmer welfare, including spending Rs 1,200 crore to turn the Chambal ravines into cultivable land and opening of customized processing and service centres in each block which will be run by farmers.

Hailstorm hits standing crops on 1.25L hectares in Maharashtra

➤ Unseasonal rain and gusty winds with hailstorm hits 11 districts in Marathwada, Vidarbha and North Maharashtra. According to primary punchnama, agriculture crops on more than 1.20 lakh hectares badly affected. The hailstorm and unseasonal rain badly hit Buldhana, Amravati in western Vidarbha and Jalna in Marathwada region. The primary report of the punchnama was submitted to the revenue department. Pandurang Fundkar, minister for agriculture took review of the crop loss. According to the minister, total 1086 villages comprising 50 talukas and 11 districts come under loss by the natural calamity. “As of now, total crop on 1,24,294 hectares land lost partially or completely. Punchnama is still incomplete and we fears the loss will be more than expected,” said the minister.

Gujarat cotton crop pegged at 105 lakh bales in 2017-18

➤ Cotton production in Gujarat is estimated to be around 105 lakh bales during the ongoing 2017-18 crop year as compared to 89 lakh bales (one bale weighs 170 kg) in 2016-17, states the January estimate by Cotton Association of India (CAI), a national trade body representing an entire cotton value chain. The association, however, has lowered cotton production in the country by 8 lakh bales to 367 lakh bales from its earlier 375 lakh bales estimate released in December 2017. The reduction is largely on account of severe infestation of pink bollworm in cotton crops, especially in Maharashtra, CAI said in a statement. Although there were instances of pink bollworm infestations in Gujarat, the production output estimate for Gujarat has been kept unchanged, meaning there is minimal adverse impact of the pest attack. Precautionary measures adopted by farmers in Gujarat and the pest infestation at fag end of harvesting (in second half of December 2017) after first and second picking saved the cotton crop from any significant damage, said agriculture experts. According to state agriculture department data cotton acreage in Gujarat increased to 26.42 lakh hectares in 2017-18 from 24.04 lakh hectares in the previous year.

Vasundhara waives Rs 8,000-cr farm loan

► Presenting a populist Budget on the eve of Assembly polls due in December, Rajasthan Chief Minister Vasundhara Raje announced one-time loan waiver of Rs50,000 for small and marginal farmers in the over-due and outstanding category of short-term crop loan provided by cooperative banks with a deadline of September 30, 2017. “The loan waiver will benefit nearly 20 lakh farmers but will cost the state exchequer Rs8000 crore,” Raje, who is also holding the finance portfolio, told the Rajasthan Assembly. A permanent institution titled Rajasthan State Farmer Loan Relief Commission would be set up to deal with farmers’ loan and other related matters on routine and merit basis, Raje said in her 140-minute speech. The government would provide an interest subsidy of Rs384 crore and Rs160 crore for compensation interest subsidy on short-term crop loans to farmers through central cooperative banks, she proposed.



Farm loans linked to crop insurance

► Farmers obtaining agricultural loans through the cooperative banks in Rajasthan will be automatically brought within the ambit of the Prime Minister’s Crop Insurance Scheme. The initiative forms part of the State government’s efforts to promote the concept of a single comprehensive insurance cover for agriculturists. Principal Cooperative Secretary Abhay Kumar said that the premium amount would be deposited with the insurance company on time and the interests of farmers protected.

Micro banking facility in NE to help farmers

► In order to improve financial health of farmers and people living in rural areas, the Ministry of Development of North Eastern Region (DoNER) and the Ministry of Agriculture will create a micro banking network in North Eastern States to provide financial assistance and expertise to promote sale of Kiwi fruit, dairy products, poultry, fishery pisciculture and piggery across the country. The micro banking network will help to promote and sale of corrugated sheets and bricks of bamboo from NE States in different parts of the country. The financial assistance would be provided through the Ministry of Agriculture’s wing, the National Cooperative Development Corporation (NCDC). The NCDC will also provide expertise to people of remote areas of N-E States where banking system is not available. Ministry of DoNER joint secretary SN Pradhan said that the micro banking network will help a lot to improve financial health of people of NE States. The North-Eastern region comprising Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim and Tripura, spread over nine per cent of the country’s total land mass, contributes only three per cent



to the country’s Gross Domestic Products. This will also help people to earn more money through other activities. In longer run, it will woo investors to invest in the region. Officials say the region remains isolated from the rest of the country and has not been able to attract investors or produce skilled labour and entrepreneurial resources. It has failed to transform even the primitive agricultural practices of the region into modern commercial agriculture. In addition, the region has not received the attention of the central government in building the required essential infrastructure for progress. All this has alienated the northeast from the mainland and proved to be a prime factor for the continuance of insurgency in the region.

SBI to offer credit cards to farmers

State Bank of India is exploring the possibility of issuing credit cards to farmers. The bank, through its credit card arm SBI Card, a joint venture company between SBI and GE Capital, currently issues credit cards to farmers on pilot basis in the states of Rajasthan, Gujarat and Madhya Pradesh. According to Rajnish Kumar, Chairman, SBI, farmers currently have access only to Kisan Credit Card (KCC) which is more like a debit or RuPay card linked to a loan account. The pilot, if successful, will be rolled out across other states and will give farmers access to interest-free credit for a period of 40-45 days. "This will be the first credit card aimed exclusively at farmers. We have launched farmers' credit card on a pilot basis in three states and have received about 100 applications. Based on its success, we will go for a nationwide launch," Kumar told newsmen on the sidelines of the launch of a mobile shopping app for farmers called FarmCart. The success of the pilot would be assessed based on how well farmers adjust to the usage of the cards and the



repayment or credit culture. According to Kumar, 75-80 per cent of the spend on these cards will have to be mandatorily used for purchasing agricultural inputs. The penalty for delay in payment post the free credit period might be kept lower compared to the normal credit cards in the market. Kumar, however, refused to divulge the limit and rate of interest to be charged. "Those are yet to be worked out,"

he said. The mobile app FarmCart, which is available in vernacular language for the benefit of farmers, has been designed by a Mumbai-based start-up Poorti Agri Services. Talking about the partnership with Poorti, Kumar said, SBI will provide payment gateway for transactions launched under the new app. It will also provide credit facilities to buyers and sellers on the platform.

Maha gets Rs.12k cr Nabard loan for 26 pending projects

The BJP-led government in Maharashtra expects to give a much needed boost to the completion of pending irrigation projects as finance minister Arun Jaitley in his Budget speech reiterated the government's commitment to provide funds through Long Term Irrigation Fund (LTIF) established in National Bank for Agriculture and Rural Development (Nabard). Of the 99 irrigation projects identified under LTIF, Nabard has sanctioned a total loan of Rs 12,773 crore towards Maharashtra's share under the Prime Minister's Krishi Sinchayi Yojana (PMKSY) for the completion of 26 long-pending projects (which account for 30 per cent). The loan is being disbursed at 6 per cent rate of interest. State water resources minister Girish Mahajan told DNA, "Of the Rs 12,773 crore sanctioned by Nabard, Maharashtra has so far availed Rs 3,500 crore. In addition to the Nabard loan, the state has been granted central grant of Rs 3,860 crore for the 26 projects to be completed in a time-bound manner. This is the largest ever loan sanctioned by Nabard to Maharashtra's irrigation sector." He also informed that Jaitley has reiterated to provide funds under LTIF but also announced to expand its scope to cover specified command area development projects. The state soon expects Centre's approval for its proposal to provide a total of Rs 20,500 crore comprising Rs 15,000 crore as loan from Nabard at 6 per cent and the balance as the Central grant as a special case for the completion of 112 irrigation projects in drought-prone areas which have reported higher farmers suicides.



Import duty on pulses to hit Canada acreage

► The Centre's decision to impose import tariffs on pulses is likely to affect plantation in Canada. India, which accounts for nearly 48 per cent of the world pulse consumption, is a major importer of pulses from the US and Canada. According to OneilCarlier, Minister of Agriculture and Forestry, Government of Alberta, Canada, the farmers might opt for sowing of wheat, barley or oats as alternative to pulses for the upcoming 2018 planting season (beginning April). "Alberta has been a (key) supplier to India. (But) with this tariff imposed, I think it might be a possibility that Canadian farmers may sow less of pulses this year," Carlier told on the sidelines of the 6th Agro Protech 2018 organised by the Indian Chamber of Commerce. Pulses production in India witnessed a spike at 22.95 million tonnes (mt) in 2016-17 as compared with 16.35 mt in FY'16. With a view to support local farmers and give a boost to domestic prices, the government imposed a 50 per cent import tariff on peas and 30 per cent on lentils and chickpea. Alberta grows peas and lentils. Despite the domestic demand there, a small population and larger land base (for cultivation) means a vast majority of its pulses are exported.



40,000-t pepper imports hammered prices in 2017

► An estimated 40,000 tonnes of pepper landed in India through legal and illegal routes in 2017 and that, in turn, has hammered prices of the indigenous produce by nearly 50 per cent forcing the Centre to fix a minimum import price of Rs500 a kg. Indian imports normally are around 20,000 tonnes

per annum, Spices Board sources said. Imports of black pepper directly from Vietnam totalled 16,281 tonnes during January-December 2017. But, according to trade sources, as much as 36,000 tonnes arrived from Vietnam and Sri Lanka last year through legal and illegal routes. Even after imposing

the minimum import price, "it has been noticed that unscrupulous exporters from Sri Lanka as well as importers in India are continuing bringing in Sri Lankan pepper at Rs500 minimum import price and selling at Rs390/kg," said Kishor Shamji Kuruva, Kerala Chapter Head of Indian Pepper and Spice Traders, Farmers, Producers and Planters Consortium (IPSTFPC). The other routes through which Vietnamese pepper has landed in India are Papua New Guinea, Myanmar, Bangladesh and Nepal and it is estimated that 4,000 tonnes were smuggled into the country, he said. As a result, cheap imported stuff is dumped in the main consuming markets across the country, and this has pulled pepper prices in the country to below Rs390 a kg, said Sunil Kumar, a farmer in Sakleshpur.



Nepali tea gets own trademark

► Nepal's orthodox tea exports will no longer have the logo 'Darjeeling, India' and will be sold abroad with its own identity, 154 years after tea cultivation commenced in the Himalayan nation. Nepal has received its own logo or trademark, with the long-standing efforts of the Nepal Tea and Coffee Development Board, organisations associated with tea production, and experts in the field. The trademark comprises an image of mountains with 'Nepali Tea Quality from the Himalaya' written below it. Prior to this, Nepal's orthodox tea was being exported with the logo of Darjeeling. Nepal produces certain varieties of teas that are somewhat related to Darjeeling tea in its appearance, aroma and fruity taste. With this move, Nepali tea would get good price in the international tea market and farmers would directly be benefited, therefore all should stress proper implementation of the logo, Chandra BhusanSubba, a tea expert involved in the development of the logo. According to the National Tea and Coffee Development Board, Nepal produces tea on over 66,700 acres of land and exports mainly to India, Canada, Germany, the US and China.

Basmati shipments may rise as Iran recommences rice imports

► The reopening of rice imports by Iran could give a fillip to India's basmati shipments, which have risen by about a fourth in rupee terms in the first eight months of the current financial year. Iran is the largest buyer of India's basmati and accounts for a fourth of India's annual aromatic rice shipments of around four million tonnes. Iran, which ended the seasonal import ban in November, has started registration for rice imports, which will be from January 21 till June 21. In recent years, Iran has been placing temporary curbs on rice imports during the July-January period, mainly to protect its domestic paddy growers and support local prices during the harvest season. "Based on the current export trend, we expect basmati shipments to be higher than last year," said DK Singh, Chairman, Apeda (Agricultural and Processed Food Products Export Development Authority). Basmati is the second largest product in Apeda's export portfolio after buffalo meat and accounts for over 22 per cent of the total shipment value. In the April-November period this fiscal year, basmati exports grew 29 per cent to \$2.61 billion from \$2.02 billion in the corresponding period last year. In rupee terms, basmati exports grew 24 per cent to Rs 16,838 crore during the April-November period from Rs 13,571 crore in the corresponding year-ago period. In 2016-17, India's basmati exports stood at 3.98 million tonnes valued at over \$3.22 billion. However, Indian rice exporters are cautiously optimistic over the shipment prospects with Iran, considering the fact that they have been facing issues relating to traces of fungicide in exports to the European Union, another major market.

India Exported Coconut Products worth Rs2,084cr



► India exported coconut products worth Rs2,084crore in FY 2016-17, Union Agriculture Minister Radha Mohan Singh said. "In 2016, we started exporting coconut oil to Malaysia, Indonesia, and Sri Lanka, the countries from where we were importing earlier. For the first time, desiccated coconut is being exported to the US and Europe in large quantities from India," Singh added. For the first time, India is exporting desiccated coconut to the US and Europe in large quantities, Singh said.

Bangladesh hikes duty on grape imports, exporters approach govt

► Grape exporters from India are unhappy over the increase in import duties imposed by Bangladesh on Indian grapes. On the brighter side, new markets are opening up and a team from the US is currently in India conducting feasibility studies for possible exports. Like Europe, other countries that import grapes from India, including China, Indonesia and Russia, have decided to issue stricter residue monitoring plan (RMP) norms to the country. Next year onwards, the government has decided to issue certificates to exporters to these nations as well so that exports do not face any hurdles. Last year, India exported around 15,000 tonne of grapes to Bangladesh, senior officials from the Maharashtra Horticulture Department said. According to the official, although Bangladesh has been imposing duties, this time the taxes have become raised to the tune of `55 per kg and



therefore grape growers and exporters have approached the Centre seeking intervention from the government to ensure that these do not rise further. GagandadaKhapre, president, All India Grape Exporters Association said that the association has already approached authorities on the issue. According to officials from the Horticulture Department, exporters from India do not have to pay import duties, VAT and other taxes but higher duties have been imposed by Bangladesh which has led to some unrest among exporters. The grapes are taken to Bangladesh by road from Kolkata by local exporters.

Soon, app to procure agri implements



➤ The Punjab Government will launch a mobile application to help farmers in hiring costly agricultural implements required for post-harvesting and preparation of fields for sowing next crops. The move is aimed at helping farmers in the management of stubble/farm residue. This was disclosed by state Additional Chief Secretary, Cooperation, DP Reddy during a meeting held to address the issue of stubble burning in the state with officials from the Cooperatives Department and the Punjab Remote Sensing Centre. He said the Cooperatives Department had decided to develop a mobile app in which data of all farmers and agricultural cooperative societies would be uploaded. "This app will facilitate hiring of agricultural implements to farmers from the village-level cooperative society," he added.

Drones used to spray foliar fertilizers

➤ METHRAN Kayal, the polders in Kerala's Kumarakom that was at the centre of a controversy a couple of years ago over an alleged move to fill it up for a tourism project, is back in news, but for a good reason this time. It has now become an open lab for a new technology in the field — unmanned ariel vehicles or drones being used spraying foliar fertilisers. In a first-of-its-kind initiative of the state government, the Kerala Centre of Pest Management (KCPM) in Mankombu, Alappuzha district, in association with two private drone developers in Bengaluru, started the pilot project. The agriculture officers were satisfied with the results. "The paddy in Methran Kayal polders are facing serious threat owing to high acidity level and subsequent increase of iron content in the soil. Hence, the nutrients are being supplied through foliar spraying," said Mathew Abraham, KCPM officer, adding. "Since the size of the droplets is less than 100 micron, drones need only 10 litres water for covering one acre, whereas 100 litres are needed to do it manually."



KAU bid to get patent for fertiliser from human hair

➤ For barbers, hair is no more waste that needs money and effort to be managed. It will help them earn profits as the Kerala Agricultural University (KAU) has developed technology to make fertilizer from human hair. In a recent development, the KAU approached the Inter University Centre for Intellectual Property Rights Studies of Cusat seeking steps to get patent for the product. "With the process for getting patent on, we are unable to explain further details of the technology," said D Griija, who is leading experiments in this regard. The plan is to hand over the technology to the Kerala State Barbers and Beauticians Association (KSBBa), which will help its members produce fertilizers from hair. According to the KSBBa state general secretary U N Thampi, the research was carried out by the KAU after a memorandum and proposal were submitted to Agriculture Minister V S Sunil Kumar in July, 2016. The memorandum urged steps to bring an end to the mounting waste management issues in barber shops. The plan is to convert human hair into liquid form using certain chemicals and spray it on plants. Earlier, an experiment conducted by the Department of Agricultural Microbiology, was successful after the liquid was applied on some of the plants on the Vellanikkara campus. Hair was used after washing with chemicals and heating them in high temperature. Researchers here found healthier changes and early flowering in the plants after the liquid was sprayed on plants.

New wheat variety can help fight diabetes

➤ A new variety of fibre-rich wheat that has the potential to help fight Type 2 diabetes and bowel cancer has been developed by a team led by an Indian scientist working for the Australian national research agency. The discovery is considerably significant for India, which is often labelled the 'diabetic capital of the world', with over 50 million people suffering from the disease. Regina Ahmed, principal research scientist, Commonwealth Scientific and Industrial Research Organisation (CSIRO), told The Hindu in an email interview that the new wheat variety was rich in amylose. The amount of resistant starch, a type of dietary fibre, in products made from high-amylose wheat was 10 times more than those made from regular wheat. Resistant starch is known to improve digestive health, protect against the genetic damage that precedes bowel cancer, and help combat Type 2 diabetes. Normally, food is digested in the small intestine. This starch reaches the large intestine and disintegrates there, which reduces the speed with which glucose reaches the blood, said Dr. Ahmed, a native of Changanassery in Kerala's Kottayam district.



Cloud-based irrigation system doubles crop yield, cuts water use by 80%

➤ Scientists from the Heriot-Watt University in Edinburgh (UK) have developed a cloud-based micro-irrigation system, which when tested on a farm in south India helped cut water use and doubled crop yield. The system combines a highly localised weather forecast with local know-how on irrigation needs and soil conditions. Local farmers' knowledge on irrigation and soil conditions for each of these crops were scheduled on the cloud-based system, an official statement said. Trials were conducted under the Innovate UK-funded Smart Control of Rural Renewable Energy and Storage (SCORRES) project. "We



tested eight crops with our precision irrigation system," said Eddie Owens, director of Heriot-Watt University's Energy Academy. "The results of our initial trials were extremely encouraging. Our irrigation system reduced water and energy use by up to 80 per cent and in some of the trials, the crop yield doubled, enabling farmers to grow bigger vegetables and fruits, faster," Owens added.

At the trial farm in Tamil Nadu, eight vegetable crops were grown using the precision irrigation system. These included okra, lettuce, basil, pumpkin, corn and long beans. The next step would be to expand the trial across India and into China, Owens added.

"Existing irrigation control systems in India are typically manual, or rely on time clocks that have a lack of monitoring oversight.... This project removes the need for costly hardware, and creates a more affordable, cloud-based solution for smart irrigation," Martin Scherfler from Auroville Consulting, a SCORRES partner that oversaw the installation of the irrigation, said. Agriculture accounts for 90 per cent of India's freshwater usage. Fifty-four per cent of India faces extremely high water stress.



CHANNELIZING CREDIT TO AGRICULTURE

Agriculture - a significant contributor to rural economy – has so far survived on meagre cash flows and debt waivers. In the wake of rising production costs and market fluctuations, agriculture is becoming bracketed into a non-profitable venture. Persistent drain of work force and the reluctance of youngsters to take up agriculture as a profession pose serious threat to the food security of the country. Rural landscape is thus changing, and agriculture is seldom practised as a vocation of choice. Credit is one of the limiting factors in pursuing agriculture as a profession. Access to cheaper and reliable credit holds the key to improving rural economy and agriculture.

Rural India – the agriculture hub of India – owes its growth and progress to the developments in the agriculture segment of the country. Agriculture which contributes to the income prospects of more than half of India's population is a major source of livelihood for the rural community. Although this trend has progressively diminished, and non-farm activities have emerged as an important source of rural income, the country's reliance on agriculture cannot be displaced in near future.

Agriculture becoming capital intensive, the flow of rural credit has become increasingly pertinent for the success of agriculture. Unfortunately, the rural credit scene has been under the influence of money lenders for an unusually longer time. They still exert dominance in the rural settings, despite the presence of cheaper and reliable credit options. The flow of credit to agriculture sector has seen increments over the years. It will take many more years to negate entirely the existing disorganization in rural credit sector, till then, the governments – at the center and the state – have to work closely together to bring clarity and access of credit to Indian agriculture.

Indian Rural Credit – A Glance

Agriculture employs a considerable share of workforce in India. However, it contributes to 17.5% of the GDP (at current prices in 2015-16). The agriculture sector's contribution has decreased from more than 50% of GDP in the 1950s to 15.4% in 2015-16. Agricultural growth has been fairly volatile over the past decade, ranging from 5.8% in 2005-06 to 0.4% in 2009-10 and -0.2% in 2014-15. Such a variance in agricultural growth takes a direct bearing on farm incomes as well as farmers' ability to avail credit for investing in their land holdings.

Agriculture sector has seen a continuous flow of rural credit. The total institutional credit flow



to agriculture sector had increased from Rs. 2,85,146 crore during the Ninth Five Year Plan (1997-2002) to Rs. 6,85,146 crore during the Tenth Five Year Plan (2002-2007). In line with the announcement (by the Union Finance Minister in 2004) of doubling the institutional credit flow to agriculture sector, a target was fixed at Rs. 2,25,000 crore for the year 2007-08, with an inclusion of 50 lakh farmers into the ambit of farm credit. Against the target of disbursing Rs. 2,25,000 crore to this sector, all banks (including cooperatives and regional rural banks) disbursed Rs. 2,54,658 crore, which was 113 percent of the targeted amount fixed for the year 2007-08.

The agriculture sector's contribution has decreased from more than 50% of GDP in the 1950s to 15.4% in 2015-16. Agricultural growth has been fairly volatile over the past decade, ranging from 5.8% in 2005-06 to 0.4% in 2009-10 and -0.2% in 2014-15.



Further, in the Eleventh Five Year Plan (2007-2012) also, the target for the flow of credit to agriculture sector was set on the higher side, and, by the end of the financial year 2010-11, the amount disbursed by all banks was recorded at Rs. 4,68,291 crore.

In all the budget speeches throughout the years, it has been noticed that the credit flow to agriculture sector has always exceeded the targets. For instance, the targets set for the financial year 2012-13 and 2013-14 were at Rs. 5,75,000 crore and Rs. 7,00,000 crore respectively. The actual disbursement of credit to agriculture sector for the year 2013-14 has likely touched Rs. 7,35,000 crore. This indicates that there has indeed been a continuous increase in the flow of institutional credit to agriculture sector over the last few years.

Institutional credit to agriculture sector during the period between 1999-2000 and 2013-14, has witnessed an increase of almost 15 times. In absolute terms, the total flow of institutional credit (by Cooperative Banks, Regional Rural Banks, Commercial Banks and Other Agencies) to agriculture sector (which constitutes short term, medium term and long term credit) during 1999-2000 was Rs. 46,268 crore, which has increased to Rs. 3,84,514 crore in 2009-10, and further to Rs. 6,07,375 crore and Rs. 7,35,000 crore in 2012-13 and 2013-14 respectively. Of this, however, short term credit (production credit) accounts for a major share, i.e. almost two-third of the total institutional credit flow to agriculture sector. In fact, the share of short term credit ranges between 58 - 78 percent

during the period between 1999-2000 and 2012-13.

From this steady supply of credit, sadly a very small amount percolates to the largest category of farming population in India. The Input Survey, 2006-07 reveals that only 19.6 percent of the estimated operational holdings belonging to the marginal category of farming had found shelter in the institutional credit for agricultural purposes. Such percentage shares for small, semi-medium, medium and large operational holders constituted 33 percent, 35 percent, 39 percent and 40 percent respectively. In all, only 25 percent of estimated operational holdings had taken institutional credit for agricultural purposes out of the total number of operational holdings in the country. This signifies that rest 75 percent of the total operational holdings did not avail of institutional credit.

RURAL CREDIT PROFILE

Credit assumes many forms in the rural credit business. The most common form is the direct finance which comprises of credit provided directly to cultivators. In this category, short-term- credit accounts for a significant share. These crop loans reach the farmers as cash or in kind such as the supply of fertilisers and seeds. Medium and Long term loans also constitute direct finances.

The second component of agricultural finance is called "indirect finance", which does not go directly to cultivators but to institutions that support agricultural production in rural areas. Loans to input dealers for their role in the provision of agricultural inputs and loans to electricity boards for supplying power to cultivators fall under this category. In the 1990s, when India began to implement the policy of financial sector liberalisation, there was a significant slowdown in the growth of commercial bank credit to agriculture compared to the 1980s. Medium term credit includes credit requirement of farmers for medium period ranging between 15 months and 5 years and it is required for purchasing cattle, pumping sets, other agricultural implements. Medium term credits are normally larger in size than short term credit. Farmers also require finance for a long period of more than 5 years for purposes such as buying additional land or for making any permanent improvement on land like sinking of wells, reclamation of land,



horticulture etc. This type of loan is called long term credit.

Apart from these traditional categories of credit, other forms of credit has also been lending support to the farmers. Crop insurance has also been able to extend the much needed financial aid to the farmers at times of distress and hence can be considered as an important source of rural credit. India has dabbled with this category and over the years have acquainted with a number of schemes. National Agricultural Insurance Scheme (NAIS) introduced during Rabi 1999-2000 and implemented by Agriculture Insurance Company of India limited protected the farmers against the losses suffered on account of natural calamities. The Scheme was available to all the farmers both, loanee and non loanee, irrespective of the size of their holding. The Scheme envisages coverage of all crops including cereals, millets, pulses, oilseeds and annual commercial and horticultural crops in respect of which past yield data is available. The modified version has many improvements viz., Insurance Unit for major crops are village Panchayat or other equivalent unit; in case of prevented / failed sowing claims up to 25% of the sum insured is payable, post-harvest losses caused by cyclonic rains are assessed at farm level for the crop harvested and left in 'cut & spread' condition up to a period of 2 weeks in coastal areas; individual farm level assessment of losses in case of



localized calamities, like hailstorm and landslide; on-account payment up to 25% of likely claim as advance, for providing immediate relief to farmers in case of severe calamities; threshold yield based on average yield of past seven years, excluding up to two years of declared natural calamities; minimum indemnity level of 80% is available (instead of 60% in NAIS); and premium rates are actuarial supported by up-front subsidy in premium, which ranges from 40% to 75%, equally shared by Centre and States. Weather Based Crop Insurance that was introduced in 2011-12 on a pilot basis with an aim to make it more convenient for the farmers to avail crop insurance appeared to have received good response from the farmers. Pradhan Mantri Fasal Bima Yojana (PMFBY)-2016 has been the most recent

version of crop insurance in the country. Pooling in the important learning from all the earlier schemes and taking into consideration of access to technology in the recent days, Pradhan Mantri Fasal Bima Yojana promises to take care of the loopholes of earlier schemes. The Fasal Bima Yojana has done away with this cap on premium. The sum insured per hectare for a farmer is now decided by the District Level Technical Committee and is pre-declared and notified by the State Level Coordination Committee on Crop Insurance. The farmer also pays less — the premium he shells out is 2 per cent of the sum insured for all kharif crops and 1.5 per cent of it for all rabi crops. For horticulture and commercial crops, the premium is 5 per cent of sum covered. The remaining premium is

S.NO	TIME FRAME	INITIATIVE/SCHEME
1	1971-1978	First individual Approach Scheme
2	1979-1984	Pilot Crop Insurance Scheme (PCIS)
3	1985-1999	Comprehensive Crop Insurance Scheme (CCIS)
4	Rabi 1999-2000 to Rabi 2013-14	National Agricultural Insurance Scheme (NAIS)
5	Rabi 2010-11 season	Modified National Agricultural Insurance Scheme (MNAIS)
6	2007-08	Weather Based Crop Insurance Scheme (WBCIS)
7	2009-10	Coconut Palm Insurance Scheme (CPIS)
8	2016	Pradhan Mantri Fasal Bima Yojana (PMFBY)



Weather Based Crop Insurance that was introduced in 2011-12 on a pilot basis with an aim to make it more convenient for the farmers to avail crop insurance appeared to have received good response from the farmers

paid by the government. This will be done online once the E platform is put in the place. During 2017, under Rabi & Kharif crops, 5 crore 71 lakh farmers were provided protective coverage under this scheme.

Loan waivers add an interesting layer to the credit flow in agriculture. Derided and often relegated as a populist measure, the series of loan waivers have added credit to the agriculture kitty, at the expense of an ethical credit behavior. Uttar Pradesh, last year, decided to waive loans of Rs 36,359 crore taken by about 94 lakh small and marginal farmers. The reason for this benevolent action was the poll promise by the Chief Minister Yogi Adityanath. The waiver amount included Rs 5,630 crore loans of seven lakh farmers whose accounts were declared non-performing assets (NPAs) by banks. Even last year, loan waivers made repeated appearance in different states such as Tamil Nadu and Telengana. Post Maharashtra's decision to waive loans, many more states are believed to demand this extravaganza. India faces a cumulative loan waiver of Rs 3.1 lakh crore (\$49.1 billion), or 2.6% of the country's gross domestic

product (GDP) in 2016-17.

Another phase in rural credit began with the introduction of micro finance. Microfinance constituted the provision of thrift, credit and other financial services and products of very small amounts to the poor enabling them to raise their income levels and improve living standards, operated through Self-Help Group (SHG)-bank Linkage (SBL) and Micro-Finance Institutions (MFIs). The SBL is the larger model and is unique to India but MFI model was internationally more established. Microfinance makes finance accessible and available for consumption needs. Freedom from the need for collateral is the other great attraction of microfinance. The Union Budget presented by the Hon'ble Finance Minister Shri Arun Jaitley, for FY 2015-16, announced the formation of MUDRA (Micro Unit Development and Refinance Agency) Bank which was formed to fund and promote microfinance institutions.

RURAL CREDIT IRREGULARITIES

Institutionalization of rural credit has become the top priority of the government. While schemes galore at the national level to channelize the credit flow to rural strongholds, certain pockets remain unreachable. Debt traps have become far

too common and farmer suicides have not seen any let down. According to data released by National Crime Records Bureau (NCRB) 5,600 farmers committed suicide across the country in 2014. Maharashtra and Telangana, infamous for the stranglehold of private money-lenders on farmers, have kept their dubious record intact. As many as 33.4% suicides in Maharashtra and 23.2% in Telangana were due to 'bankruptcy or indebtedness'.

Although the entire system of credit delivery could not be blamed, certain instances suggest a malpractice. The interest subvention scheme which was introduced in 2006-07, provides loans at 7 per cent interest (upper limit of Rs 3 lakh), and if payment is regular, gradually it is lowered to 4 per cent. Some states have extended loans even at zero interest rate to farmers. This has resulted in a significant increase in short-term agricultural credit, with actual disbursements consistently surpassing targets, the expense on account of it has increased from Rs 3,283 crore in FY12 to Rs 13,000 crore in FY16. It is hard to believe that the amount has percolated to farmers. There is reasonable evidence that a significant proportion of crop loans granted at subvented interest rates has quite deceptively seeped for other purposes. A beneficiary of this scheme whether a farmer or someone posing as a farmer, receives the loans at a concessional rate of 4 per cent and instead of investing that in farming he can deposit at least a part of it in fixed deposits in the bank, earning about 8 per cent interest, or even become a moneylender to offer loans at 15-20 per cent interest to those who don't have access to institutional sources of finance. Short-term credit from institutional sources reached 110 per cent of the total value of agricultural inputs in 2014 (NAS 2015), and at the same time, AIDIS data shows 44 per cent loans were from non-institutional sources in 2013. This suspicion is reaffirmed when one looks at the month-wise disbursement of agricultural credit, which spiked to 62 per cent of annual



disbursement in the last quarter of FY14, with no corresponding spike in agri-production activities. Even the RBI committee has recommended phasing out the interest subvention scheme.

Loan waivers are another category of financial support that have time and again supported the farmers. Although distorting, this financial aid bails out farmers from having to pay back their loan amount. Although the merits are temporary, this has become the favourite political instrument. Generalized loan waivers raise expectations among the farmers for such future interventions acting as a disincentive to pay back their loans. This would also raise the number of defaulters, and create a crop of habitual defaulters.

There is no dearth of loans or schemes that extend financial assistance to the farmers. But somehow, not all are benefited by this scheme. Money lenders still influence the farmers. The government should raise the awareness of the farmers and they should be made aware of the existence of such schemes. This will kill the unorganized sources of credit and expand institutionalization of rural credit.

Agriculture credit has an important influence on enhancing India's agriculture potential. Investing in proper and relevant technologies requires Credit. Access to reliable and cheaper credit is significant to sustainable agriculture and rural development.

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THE PRO-AGRI BUDGET

Presenting the fifth and the last union Union Budget on February 1 2018, Finance Minister Arun Jaitley's reiterated the resolve of the current government of doubling the farmers' income. "My Government is committed for the welfare of farmers. For decades, country's agriculture policy and programme had remained production centric. We have sought to effect a paradigm shift. Honourable Prime Minister gave a clarion call to double farmers' income by 2022 when India celebrates its 75th year of independence. Our emphasis is on generating higher incomes for farmers," said the FM. Union Budget 2018 was predominantly an agriculture budget with a slew of measures engendering farmers' welfare and agriculture development. This year too the Government has increased the volume of institutional credit for agriculture sector from Rs.10 lakh crore in 2017-18 to Rs. 11 lakh crore for the year 2018-19.

The significant announcement came with regard to the MSP of Kharif crops. It has been proposed to keep MSP for the all unannounced crops of kharif at least at one



and half times of their production cost. Mechanisms will also be generated so that farmers would get full benefit of the announced MSP. It has been assured that Niti Ayog, in consultation with Central and State Governments, will put in place a fool-proof mechanism so that farmers will get adequate price for their produce. For the farmers to make decisions based on prices likely to be available after its harvest, Government would create an institutional mechanism, with participation of all concerned Ministries, to develop appropriate policies and practices for price and demand forecast, use of futures and options market, expansion of warehouse depository system and to take decisions about specific exports and imports related measures.

With regard to the e NAM, FM informed that 470 APMCs have been connected to e-NAM network and rest will be connected by March, 2018. The existing 22,000 rural haats would be upgraded and developed into Gramin Agricultural Markets (GrAMs). In these GrAMs, physical infrastructure will be strengthened using MGNREGA and other Government Schemes and they would be electronically linked to e-NAM and exempted from regulations of APMCs. An Agri-Market Infrastructure Fund with a corpus of Rs. 2000 crore would be set up for developing and upgrading agricultural marketing infrastructure in the 22000 Grameen Agricultural Markets (GrAMs) and 585 APMCs.

Cluster based development of agri-commodities and regions will be promoted in partnership with the Ministries of Food Processing, Commerce and other allied Ministries. Organic farming by Farmer Producer Organizations (FPOs) and Village Producers' Organizations (VPOs) in large clusters, preferably of 1000 hectares each, will be encouraged.



Women Self Help Groups (SHGs) will also be encouraged to take up organic agriculture in clusters under National Rural Livelihood Programme. A sum of Rs. 200 crore has been allocated for organized cultivation and associated industry.

For the food processing sector, the government has decided to double the allocation from Rs. 715 crore in 2017-18 to Rs. 1400 crore in 2018-19. Government will promote establishment of specialized agro-processing financial institutions in this sector.

The Government has also proposed to launch an "Operation Greens" on the lines of "Operation Flood". "Operation Greens" shall promote Farmer Producers Organizations (FPOs), agri-logistics, processing facilities and professional

FM informed that 470 APMCs have been connected to e-NAM network and rest will be connected by March, 2018. The existing 22,000 rural haats would be upgraded and developed into Gramin Agricultural Markets (GrAMs).

management and a sum of Rs. 500 crore has been allocated for the same.

Proposals to liberalize export of agri-commodities are afoot and state-of-the-art testing facilities in all the forty two Mega Food Parks will be set up. Extending Kisan Credit Cards to fisheries and animal husbandry farmers are also on the agenda.

A Re-structured National Bamboo Mission with an outlay of Rs. 1290 crore to promote bamboo sector in a holistic manner has also been proposed. Scope of the Long Term Irrigation Fund (LTIF) in NABARD would be expanded to cover specified command area development projects.

A Fisheries and Aquaculture Infrastructure Development Fund (FAIDF) for fisheries sector and an Animal Husbandry Infrastructure Development Fund (AHIDF) for financing infrastructure requirement of animal husbandry sector with a total Corpus of Rs.10,000 crore has also been proposed.

A suitable mechanism to enable access of lessee cultivators to credit without compromising the rights of the land owners is also being put in place. It has been decided to extend a favourable taxation treatment to Farmer Producers Organisations (FPOs) for helping farmers aggregate their needs of inputs, farm services, processing and sale operations. Addressing the air pollution in the Delhi-NCR region, a special Scheme will be implemented to support the efforts of the governments of Haryana, Punjab, Uttar Pradesh and the NCT of Delhi to address air pollution and to subsidize machinery required for in-situ management of crop residue.

Ground water irrigation scheme under Prime Minister Krishi Sinchai Yojna- Har Khet ko Pani will be taken up in 96 deprived irrigation districts, where less than 30%

of the land holdings gets assured irrigation, presently for which Rs. 2600 crore has been allocated.

Union Budget 2018 intends to focus on providing maximum livelihood opportunities in the rural areas by spending more on livelihood, agriculture and allied activities and construction of rural infrastructure. In the year 2018-19, for creation of livelihood and infrastructure in rural areas, total amount to be spent by the Ministries

will be Rs. 14.34 lakh crore, including extra-budgetary and non-budgetary resources of Rs.11.98 lakh crore. Apart from employment due to farming activities and self employment, this expenditure will create employment of 321 crore person days, 3.17 lakh kilometers of rural roads, 51 lakh new rural houses, 1.88 crore toilets, and provide 1.75 crore new household electric connections besides boosting agricultural growth.

Agriculture Today interacted with the stakeholders in agriculture and following are the excerpts from their reflections on Union Budget 2018-19

The Union Budget 2018 provides for the greater use of clean and renewable energy sources but does not deal with the management of climate change in relation to farming. It is important to set up climate risk management R&D centres at least one at every block level. Such centres should be supported by trained Climate Risk Managers, one woman and one man from each Panchayat. Climate Change could become a mega catastrophe and there is need for immediate steps, both in the areas of mitigation and adaptation.



Dr. M S Swaminathan
Renowned Farm Scientist

On the pricing and procurement front, the Finance Minister announced that as per pre-determined principle, the Government has decided to keep the MSP for all the unannounced crops of kharif at least at one and half times of their production cost. It is essential that if price of the agriculture produce in the market is less than the MSP, then in that case Government should purchase either at MSP or work in a manner to provide MSP for the farmers through some other mechanism. If income is less than the support price, the government has said that it will make efforts to buy the surplus produce of the farmers. More allocation will be made for building warehouses and by upgrading 22,000 rural haats into Grameen Agricultural Markets. The budget also sets apart Rs. 2000 crores for an agricultural market and infrastructure fund. Several steps have been proposed for promoting sustainable agriculture such as organic farming. Horticulture will be promoted with greater attention to the marketing of tomato, potato and onion and similar perishable commodities through 'Operation Greens' with Rs 500 crore allocation.

Another welcome feature is to integrate fisheries and animal

husbandry with Kissan Credit Cards. The National Bamboo Mission will be restructured in order to enhance the cultivation and consumption of the bamboo products. The emphasis placed on Self Help Group formation, cooperatives and other organizational methods which can provide the power of scale to the small scale producers is welcome. In the promotion of organic farming, the greater encouragement will be given to Self Help Groups of women farmers under NRLM. In the case of employment and income, greater emphasis will be placed on post-harvest technology and value addition to primary products. Rs. 10,000 crore corpus will be provided for the fisheries and animal husbandry sectors. Since agriculture promotes job-led economic growth, greater support will be given to both on-farm and non-farm employment. The priority given to rural infrastructure and irrigation will help impart stability of income and employment. Malnutrition is another serious problem and we need to promote symbiotic linkages among agriculture, nutrition and health.

On the whole, the Budget addresses some of the “hotspots” in the field of farming, the most important being the management of the monsoon and the market.

Dr. Purvi Mehta

Head - Asia Agriculture, Bill and Melinda Gates Foundation

A higher allocation to agriculture in the recent budget was not unforeseen, in view of the government's focus towards the agriculture sector. What made the budget different, however, is the allocation to subsectors within agriculture and a deliberate shift towards profitability (income) for the farmers going beyond not just higher productivity. In that sense, this budget has made the much needed, shift from being a farm-centric to farmer-centric budget. Infrastructure, diversification and market access are the three key components through which the country can realize its ambitious goal of doubling of farmers' income. Higher production, especially of staple crops like rice and wheat does not by default translate into higher incomes for the farmers. This budget's emphasis on 30% higher allocation to livestock, horticulture and aquaculture actively promotes the diversification agenda. This, combined with the thrust on markets development, will contribute towards the goal of optimizing the value of farm production to translate into farmer profitability. I want to congratulate the finance minister and a very large number of experts led by the Ministry of Agriculture and Farmer's welfare for this very farmer friendly budget. The next critical step and shared goal would be to translate the budget mandates on the ground by moving the resources to the right places at the right time.



Sheril Vaidhyar

President, DuPont South Asia.

The Union Budget 2018 is forward looking and focuses on job creation with an emphasis on rural healthcare, education and employment along



with raising disposable income of citizens to revitalize the economy post demonetization thereby encouraging stability and growth. Flagship schemes announced by the Prime Minister earlier in his term such as “Make in India”, “Skill India”, “Digital India” have been strengthened to address the objectives of overall development. Steps taken towards making India a more tax compliant country are welcome and will boost tax buoyancy and growth. We applaud the enhanced focus on the agriculture sector that will help provide the resources necessary to help rural communities prosper and provide access to a safe, diverse and nutritious food supply across the country. It is encouraging to note the introduction of Operation Green to help rural farmers' needs like food storage and crop distribution. Ground water irrigation and subsidies to farmers using solar power are positive steps to accelerate the agri-income support programs. The Minimum Support Price of all crops shall be increased to at least 1.5 times that of the production cost and the government would take some concrete steps towards bringing more efficient farming techniques to farmers located in far flung areas of the country. It will be heartening to see a well-defined program that supports crop insurance along with farmers' credit. The 2018 budget promises to boost India's manufacturing and infrastructure development. We are confident that measures announced by the government today will lead to a better quality of life for all citizens of India.

B. K. Mishra**MD, FISHCOPPED**

The Fisheries and aquaculture Sector alone engages 14 million people, while it constitutes about one percent of Country's GDP.

Some key policy measures announced for the sector in the Budget such as Setting up a Fisheries and Aquaculture Infrastructure Development Fund (FAIDF) for fisheries sector and an Animal Husbandry infrastructure Development Fund (AHIDF) and extending the facility of Kisan Credit Cards to fisheries & animal husbandry farmers to help them meet their Working Capital needs. Small and marginal farmers offers something for fisheries development and fishers. The fishery sector gives a thumbs-up to the Budget on the allocation of funds as well as extension of Kisan Card facilities to fishermen. These measures shall contribute to Blue revolution significantly in the coming years.

**Mr Rajesh Aggarwal****MD, Insecticides (India) Limited**

Operation Green for vegetables is a welcome step by the government and the focus on exports of agricultural produce was much needed. The minimum

support prices for crops have also been increased significantly in Budget 2018, which will benefit crores of farmers. However, better implementation is expected to improve crop yields. Equal focus on Make In India and Invent In India is a welcome initiative for the industry as well as farmers.

**Raju Barwale****Chairman and Managing Director, Mahyco**

The Union Budget 2018 is very encouraging for the agriculture sector with several measures to ensure better post-harvest prices to farmers. The laudable intent of the Union Government in doubling farmer's income in the medium terms is amply expressed through key measures in this budget. Removing uncertainty in prices of agricultural produce is critical to give impetus to Indian agriculture. Government's proposal of 1.5x Minimum Support Price (MSP) for all Kharif crops has the potential to provide 50% gross margin to farmers and this will send positive signal to market. Government has shared its plan to fix a structure to ensure that farmers receive MSP when market prices are lower than MSP in consultation with Niti Aayog and state governments. This is another important step. Better price realization will fuel improved investment by farming community in quality inputs and practices to increase crop yield. With these measures, the entire ecosystem will be encouraged to invest in infrastructure and research & development initiatives to bring the best of innovations to Indian farmers.

**Dr. K C Ravi****Vice President - Commercial Acceptance & Public Policy (South Asia), Syngenta**

The measures announced in Union Budget 2018 aims to further supplement government's aim to double farmers income by 2022. A strong message to treat agriculture as an enterprise has been announced. The cluster approach for Horticulture crops would help in linking production to markets and ensuring farmer's profitability. Setting up an Agriculture Market Infrastructure Fund with an outlay of INR 2000 Cr along with measures to establish mega food parks will go a long way in enhancing the export competitiveness of agriculture sector. The tax incentive to Farmer Producer Organizations (FPOs) would help in enhancing the effectiveness of organized farming community. The agricultural growth which has been suppressed in recent times would hopefully pick up with these measures and the Government would bring a sharper focus on integration of technology, R&D, hybridization, and enabling public private partnerships. The other welcome features include, "Operation Greens", increasing institutional credit for agriculture to INR 11 trillion and the further strengthening the e-NAM. Also, the move to involve NITI Aayog to initiate discussions with the Central and State Governments for developing an appropriate mechanism to realise better prices for farmers is laudable and would go a long way in enhancing farmer incomes.



Ravi Sreedharan

Founder, ISDM

The Union Budget 2018 has made a very considered effort in allocations towards addressing the rural distress, particularly in the livelihood and agriculture sector. Operation Green supported by an effort to link farmers to markets for better price realisation is a welcome measure by the government. The concern, however, would be the experience of eNAM and APMC markets linkages in the past years. Translating the intended outcome of such budget allocations (eNAM and APMC markets, agricultural market fund corpus, Operation Green) into ground level is the biggest challenge for the government, especially given the nature of investments such infrastructure development demands. The MSP increase to 150% for crops, support to organic farming, increased expenditure allocations to Food processing sector at Rs 1400 crores, increased allocations to fisheries and animal husbandry, extended facilities on Kisan credit cards, and considered increase in credit volume for agricultural sector are some of the much awaited and welcome moves by the government towards boosting the agricultural economy.



Mr. Sandeep Sabharwal

CEO, SLCM Group

The Budget has focused majorly on strengthening MSME and agricultural sectors along with a higher spend on infrastructure.



These steps will cover the entire ecosystem of economy. As far as the agriculture sector and the farmers are concerned, the increase of minimum support price (MSP) of all crops is a move towards Prime Minister's vision of doubling farmers' income by 2022 and this augurs well for the agriculture value chain. Other laudable steps that will help the farming universe is connecting APMCs to eNAM network, setting up Agri-Market Development Fund and adoption of cluster model approach. Also, the announcements made in the budget provide impetus to the food processing industry with allocation of Rs. 500 crore for 'Operation Green' to provide logistics, storage and other infrastructure support. All these indicate creation of a newer BHARAT, where the development is more inclusive.

Mr. Ajay S Shriram

Chairman & Sr MD, DCM Shriram Ltd.

Budget 2018 presents an encouraging outlook for a wide cross section of stakeholders. The FM has taken a long term view by focus-



ing on agriculture, health care, education and infrastructure. It addresses specific pain points of the farmer by undertaking three major initiatives. By assuring revenue of 1.5 times the cost incurred, it has safeguarded the farmer's income. By funding agricultural market development and increasing the reach of e-NAM, access to market has been strengthened. By extending Kisan Credit Card and creating a Rs 10,000 Crs fund for animal husbandry, it has captured the changing composition of the Agriculture sector. This reflects a deep understanding of the challenges faced by the farmer and will go a long way in sustaining rural livelihoods and not just increasing production. As agriculture is a state subject, I can't stress more about the importance of effective implementation of these initiatives with the support of the state governments.

Shilpa Divekar Nirula

CEO, Monsanto India Region

The Union Budget 2018 has reiterated the government's rural focus and its commitment towards India's agriculture sector.



Announcements through measures regarding farm output seem to be the key highlight. These include MSPs, improved market linkages and increased allocation towards the food processing sector. The continued emphasis on irrigation and farm insurance will provide further impetus to help farmers manage risks associated with cultivation. An unbridled focus on agriculture coupled with enabling policies will go a long way in benefitting the larger farming community. These initiatives, if complemented with enabling policies would go a long way in achieving the government's target of doubling farmers' incomes by 2022.

Mr. Siraj Chaudhry**Chairman, Cargill India**

Proposals addressing growth of farmers' income and stimulating rural economy found center stage in the Union Budget 2018-19. These very well thought out measures can be classified either as risk mitigation or reward enhancement for the population dependent on agriculture and allied activities. The announcements in the budget are all steps in the right direction to support farmers, rural economy and encourage food processing industry. These proposals are in line with the recommendations and have been cheered by Agri economists, experts and Industry. Positive as all the proposals are, there should be realism around the time taken to execute them efficiently. Most of the proposals if implemented well are expected to make an impact in medium to long term, thus what we have today is a good roadmap to move forward with. A measure that has the potential to bring cheer to the farmers in the shorter term is the announcement of bringing all crops under Minimum Support Price (MSP) with a 50% margin over cost. This proposal has evoked much support but also skepticism. Questions around construct of the cost to farmer, impact on food inflation, export viability of Indian agriculture produce, ascertainment of cost to exchequer and their sharing between center and state still need to be answered. Effectiveness of the newly proposed MSP across a wide range of crops will require a blend of Government procurement and a price support mechanism for open sale of the produce with the price difference between MSP and traded price being borne by the government. Setting up and good use of the proposed institutional mechanism to forecast price, decide export /import policy will become critical to ensure that the new MSP regime while protecting and/or rewarding the farmer neither becomes a financial burden nor impact food inflation adversely. After the applause for the well thought out budget proposals has settled, focus will shift to their speedy and effective implementation, and that is where the government's resolve to alleviate farmer distress and uplift rural economy will be tested. Optimism should remain high, as given the onset of election season, a wise government is not likely to set high expectations without having a plan to meet them.

**Mr. Arun Nagpal****Co-Founder, Mrida Group**

I welcome the Finance Ministers' proposals for the Rural Economy. It is laudatory that the budget proposes a comprehensive package for all segments of Rural economy like Agriculture, Fishing & Aquaculture, Animal Husbandry, Food Processing, etc. as this shows the resolve to cover the Rural populace through the length and breadth of the country. The initiative to bring together all the stakeholders under one umbrella will help in speedy implementation of the projects and will put the focus firmly on sustainable development. The outlay of Rs.14.34 lakh crores on Rural and Agriculture sector shows the commitment of the Government to uplifting rural lives. Providing of Market linkages for produce by converting Rural Haats to Grameen Rural Markets on the lines of APMC shows that there is a realization in the government that more needs to be done for marketing of Rural produce. I only hope that there is equal focus on execution and outcomes so that actual changes take place on the ground.

**Mr. Raman Mittal****Executive Director, Sonalika IITL**

The Union Budget 2018-19's strong pro-farmer focus can provide a much-needed stimulus to the agriculture sector. Increasing MSP on Kharif crops, larger food processing sector allocation, and other farm programmes can accelerate the sector's growth. We also appreciate the budget's focus on increasing farmer income and profitability, through better farm price realization and adoption of low cost farming practices. The resulting growth can incentivize farmers to invest in mechanisation to expand the volume of produce from their land parcels.



Atul Chaturvedi**CEO, AgriBiz, Adani Wilmur**

This year's budget announcements by the Finance Minister, Mr. Jaitley reflected the growing realization among Policy Makers that GDP growth above 7% is meaningless with Agriculture GDP languishing at around 2%. The problem gets compounded with the fact that almost 50% of our work force is engaged in Agriculture or related activities. No wonder this year's budget was full of announcements for uplifting rural economy and working towards Prime Minister's stated goal of doubling farmers' income by 2022. The declaration of Government's intent of cost plus 50% profit to farmers is laudable. However, currently MSP is applicable on 23 items plus Sugar. If Government Agencies were to buy all the commodities selling below MSP, we would end up having all the godowns full and industry starved of raw materials. I am sure this cannot be the intent of the policy makers. For defending MSP, the BHAVANTAR SCHEME of MP seems to be a winner as it allows market forces to work naturally without distortion and the farmer is also assured of getting MSP even if prices are ruling below the same. The learnings from MP should help in formulating a robust scheme and the Government would be saved from the blushes of storing massive quantities in warehouses under sub normal conditions. The announcement pertaining to institutionalizing Demand Projection and Price forecast can be a game changer, if domain experts from Private Sector are also roped in the decision making body. Needless to say, someone who is handling operations on a day to day basis would be in a much better position to guide and predict the future. Commercial intelligence would improve dramatically in the decision making process. The Government has still not dismantled the APMC act probably for want of fool proof alternatives. We would suggest that they should at least remove obligation of APMC as far as Fruit and Vegetables are concerned. Further, they should allow the farmer to decide whom and where to sell instead of being forced to sell through APMC yards alone.

Announcements pertaining to FPO and starting 22000 Agri Haats are welcome. However, the issue of land aggregation has only been touched at the fringe via Cluster approach. Big ticket investment in Agriculture from private sector would only come after land reforms are in place. The draconian Essential Commodities Act which is a relic of Socialist Era of Sixties has been left untouched. This act has done irreparable harm in throttling development of a strong supply chain in our country. Private Sector investment in Agri infrastructure has shied away. In a country producing more than 275 million tonnes of Grains there is no place for ECA.

**Mr. Parimal Shah****Vice President, MK Jokai Agri Plantations Pvt. Ltd.**

The Union Budget FY18-19 is encouraging especially because of the importance that the Government has given to the Agricultural sector and to Agri-Exports.



We sincerely hope that these announcements shall lead to implementation of tangible incentive programs for the Farming sector of our Nation, especially the Tea Plantation sector. The Tea Industry is India's 3rd largest employer (after the Indian armed forces and the Indian railways) and provides permanent direct employment to 1.5 million people and indirect employment to another 4.5 million people. Furthermore, close to 5,60,000 hectares of land across our Nation is currently under Tea cultivation. On a Global level, we are today the 2nd largest producer of Tea with an annual output of 1,275 Million Kgs, which translates to 29,000 crore INR and which is 24% of the World's Tea output. Despite this, Indian Tea exports are still at a mere 18% of our total production. The recent increase in the MEIS scrip for exporters has been more than offset by the strengthening rupee against the USD. This means that more tangible export benefits are required by the Tea plantation sector thereby allowing us the possibility to invest more in our farms, factories and produce superior quality Teas which could command greater value in the international markets and make our industry more export-centric. Furthermore, considering the ever-increasing labor wage hikes, such incentives have now become extremely crucial for the industry to survive and sustain.



Dr. PK Joshi

Director- South Asia, IFPRI

On expected lines, the budget aimed at strengthening agriculture and rural economy. This budget has very well packaged various provisions for making agriculture more efficient, sustainable and resilient. The key pillars to strengthen agriculture sector (improved technologies, appropriate policies, effective institutions and required infrastructure) are well reflected in the budget speech of the Finance Minister. The most significant one is accepting the long pending demand of the farmers on minimum support prices (MSP), fixing 50 per cent higher than the production cost. It is important because farmers rarely get the benefit of higher retail prices due to low farm harvest prices. Announcing higher MSP is not enough, unless it is procured at that price or effective mechanisms are made to compensate farmers in the event of fall of farm harvest prices below MSP. With exceptions of rice, wheat and sometime pulses, oilseeds and potato, government is not procuring at MSP, even if the farm harvest prices fell. It is welcoming that the Finance Minister has mandated the NITI Aayog to develop mechanisms to compensate farmers when prices fall below MSP. Another important part of the budget is developing 22 thousand Gramin Agricultural Markets, and linking them with e-NAM. The proposal of developing gramian markets will have far reaching implications. Access to markets will benefit farmers, especially small and marginal, who have less marketable surplus and high transaction costs. They will realize better prices and their marketing costs will come down significantly. Developing gramian markets will also generate employment opportunities for rural youths and induce input markets, especially seed. The budget has provision to strengthen farmer producer organizations and women self-help groups. Since Indian agriculture is dominated by smallholders, aggregating them is necessary to harness economies-of-scale in production, processing and marketing. FPOs and self-help groups need to be linked with the proposed new food parks for processing and marketing. It is welcoming that the FPOs established on the pattern of cooperatives and having transactions less than Rs.100 crore, will now be exempted from income tax. This is a big relief to the existing FPOs and an encouragement for many start-ups to promote FPOs for production, processing and marketing. Provision for agricultural credit has gone up from Rs.10 lakh crore to Rs. 11 lakh crore. Now fisheries and dairy farmers can also avail the benefits of Kisan Credit Card. This will further boost the dairy and fisheries sectors. In addition, aquaculture development fund and animal husbandry development fund have been created. All these will promote these sectors and increase incomes of farmers and generate employment opportunities. The budget has further strengthened the Prime Minister Irrigation Scheme by allocating Rs.2600 crores for groundwater development in 96 most deprived districts for assured irrigation. This will build resilience to agriculture by reducing production risks due to droughts. Overall, the budget is pro-agriculture, which must cheer farmers, especially small and marginal farmers.

Mr. Jay Singh

Managing Director, CLAAS Machinery



We are happy that the Union Budget has focused on steps towards improving farmers' income especially with the initiative of 1.5x MSP on all kharif crops. As farmers' income improves, the entire value chain will benefit. In the long run, this will improve employment opportunities and attract investments in agriculture as well. By assigning more outlay towards the credit facilities for farmers, the Government has opened doors for opportunities to invest in farming processes & systems. The farm machinery sector should pitch in by introducing higher technology machines to improve efficiency in Forage & grain harvesting, straw baling and the much needed mechanization of paddy transplanting process. A related opportunity emerging is the digitization of farming processes, equipment fleet management and 'uberisation' of the process of equipment rental. While there was an unfulfilled opportunity to encourage more investment in mechanization of farms by making provisions towards credit subsidies and custom hiring centers, on the whole, the budget certainly was farmer-centric and has laid out concrete steps towards doubling farmers' incomes by 2022.

Mr. Faisal Ahmad
Founder & CEO, BIS
Research



To be able to fully realise the potential of Agriculture exports, the government needs to invest heavily in technology introduction across production and distribution. A mechanised and connected farm will go a long way to ensure high productivity and timely delivery to the market. Many countries including Israel has successfully demonstrated the technological know how in optimising the farm output. With high arable land but small holdings, the Govt should look beyond merely utilising the existing farm, and should actively promote the modern agricultural methods such as vertical farming and hydroponics.

Mr. Hanmantrao Gaikwad
Chairman and Managing Director, BVG Life
Sciences Limited and BVG India Limited



I am happy to see the emphasis on agriculture, and allied sectors of fisheries and animal husbandry. Doubling income of farmers from the same land, by 2022 is an ambitious target. Now this will be within reach thanks to this budget allocation. By linking MSP to production cost, promoting cluster-model approach, along with the focus on bamboo, food processing, and market development, I see that the government is aiming to drive professionalism, standardization, and specialization in the agriculture sector. In the long run, this will strengthen the agriculture and allied sectors, and bring in more jobs into both rural and urban economies.

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AGRICULTURE
TODAY

PURSUING THE PASSION

It was all excitement and enthusiasm when I returned to agriculture after nearly thirty years. A lot has changed... much more than just the new technologies and practices that have redefined farming. The perception of farmers have changed and many have sacrificed 'conventional crops' and are cultivating only crops which are labelled "commercially feasible".

The heart of Nalgonda district, has the best suited climate and soil type for sweet lime cultivation. Since sweet lime cultivation was new to me, I started to learn more about the crop. Initially, most of the information came from the fellow farmers and

concerned officials of the region. I discovered that the common practice was to extensively use pesticides, fertilizers and artificial nutrients and expect maximum yield.

However, the yields weren't picking up, neither in terms of input-output expectations, nor in terms of produce per se. After five years of mimicking my fellow-farmers, my investments had doubled, but definitely not the yield.

What's worse was the overflowing criticism about not "investing enough". My head spun under the random numeric mantras that "scientifically" transform yield:

"Plants require 1.5kgs Nitrogen,

300gms of Phosphorous Pentoxide, 400gms of Potassium Oxide, 40kgs of Farm Yard Manure, 8kgs of Neem Cake, 1500gms of Urea, 2000gms of Super Phosphate and 750gms of MOP... "

All this, along with regular spraying of micro nutrients, pesticides, fungicides, and other ecologically harmful chemicals such as ethanol, monocrotophos etc. My way of nurturing the crop was tantamount to chemical abuse on the soil. After series of such thoughts, I finally decided to stop using these chemicals, which aren't doing any good to the eco system, causing irreparable damage to the soil and also the human life.



Options in Organic Farming

Discouragement poured in from friends and fellow farmers, who genuinely believed that optimal usage of fertilisers and chemicals would do the trick. They were sceptical of 'organic farming' and cautioned me about experimenting with a method of the bygone era. Yet, I still firmly believed that it was the right way forward for me... and for the future. I believe that several methods of organic farming will make a comeback... some in all-new avatars that better utilise technologies.

Having decided to be an Organic Farmer, I started to learn more about farming in general, eventually clearing all the doubts I had about different organic farming techniques.

While exploring information and available options on organic farming, I came across GeoGreen, - a fully organic compost manufactured using sugarcane bagasse from TATA. The manufacturers claimed the presence of beneficial microbes and assured the compost being rich in Nitrogen and Phosphorus and many other nutrients like boron, zinc, magnesium etc. I started using 3kgs of GeoGreen per plant, and while the tree started to flower, I used organic nutrients like Swarnaphal and TATA's Bahar to arrest the fruit dropping. The results were soon visible, leaves now became much vibrant, stems and twigs at the edges now contained more moisture. Even visible changes in the soil were evident, a lot of earthworm colonies



had mushroomed and overall, the farm started to look lively.

Sri Palekar's technique of "Zero Budget Natural Farming" caught my next immediate attention, and I started learning more about it. Neemastram, a pesticide to control pests that feed on tender leaves and flowers and Jeevamrutham were used in my crops. Surprisingly not many fungal diseases were noticed on the fruit except 'mangu'- (black patches on the fruit). Overall, the quality of the fruit and also the yield had improved.

With such practices, results started showing rather quickly. As rainy season started, there was noticeable change of 'life'... around my trees. The air buzzed once again with the breath of life.... colonies of worms marked their ownership over my land as they crawled with pride; red velvet mites began to entrance my children.... My tryst with Organic Farming went on to prove that "Life begets life"....

In the Second year of Organic Farming, I went a step ahead and planted black gram, chick pea, ground nut in the spaces between the trees as intercrops and used sprinklers for irrigation. And the results were stunning. The entire orchard took a new lease of life.

Each tree has now grown at least 2-3 feet in height and all around, and flowering and bearing has also increased considerably.

The quality of fruit has improved; so has the size. The small crops between the trees helped reduce the radiation on ground, which lessened the moisture loss in the soil and also controlled the growth of weed plants. Root rot has been controlled.

My soul soared when I caught sight of a variety of birds that started taking shelter in my farm. The best part is that this has controlled pests that feed on tree bark and leaves which cause a major damage to the growth of the plant. And from a purely commercial perspective, my overall investment has come down many folds.



Mr. Hanumanth Devulapalli
Telangana

THE CO₂ FACTOR IN FARMING SOILS

The release of carbon dioxide from soil due to soil biology / microbial activity is so pervasive that it is almost impossible not to observe it. Curiously, this which is a powerful indicator of soil health, is rarely observed and measured to be able to examine the soils.

Henrik Lundegardh, a Swedish, soil scientist, in 1920's established an essential framework to be able to understand soil biology and in turn crop productivity. It was of immense concern to him and many others that there was an early rush to move to inorganic methods of farming with chemicals and discovery of mineral nutrition.

It was his view and which today is seen coming around full circle that the biological functioning of soils ought to be routinely tested for fertility assessment. The indicator suitable was seen to be soil CO₂ respiration as this would indicate life in soil and be inclusive of metabolic

activities of all soil bacteria, fungi, arthropods, plant roots etc.

Lundegardh for decades set up experimental farm plots to be able to observe as to how different land management practices worked on this CO₂ factor and also adjusted soil profiles with microbe rich manure to measure and maintain at steady levels the soil carbon. He was wonderfully able to demonstrate a significant connection of soil respiration to plant photosynthesis.

And this aspect is today observed intuitively by biological farmers --- that plants take up CO₂ not necessarily from the atmosphere but to a higher degree from the

soil respiration. In case the of soils releasing lesser CO₂, the plants do try to obtain from the atmosphere. But the scarcity affects the plant and partial starvation occurs, which manifests itself as stress and weakness, exposing the plants to incidence of pests and disease.

Lundegardh, back in 1926, lamented that the only attention being paid to agriculture was inputs from mineral fertilizers, whereas biological pathways existed to do just that and which meant:

- Microbial activities to mineralize organic nitrogen to nitrates
- Soil aggregate formation due to microbial activity
- Making available CO₂ for plant photosynthesis through respiration of soils.

Giving credibility to such observations are some recent studies on the highly functioning eco systems, in several parts of the planet, that the cycle of CO₂ (and O₂) between plants and soils is almost completely closed.

Sadly the post war business opportunities of industrialization has had its effect on agriculture, worldwide. Mostly, all the soil testing laboratories today evaluate soils for minerals to be able to assess what has been pulled out by way of cropping and what needs to be put back into soils by way of NPK etc. The field of soil biology was rarely considered. The protocol set for laboratory soil tests as on date are many decades old and have not taken into account the soil biology or remotely so. Of course, the idea which pre supposes all, is that without



inorganic fertilizers the crop yields would not be sustained and hence food output being reduced would have serious consequences as the population keep adding up.

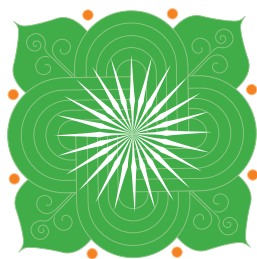
By the same logic then why does hunger still persist in parts of the world when there is enough food produced globally? This would be a fit discussion in present times to try to grasp as to where are we headed. Soil degradation in our country is a subject to be deeply studied, as it undeniably relate to farmers of the land. Important is the joining of dots to examine just how much is the climate affected /adapting to the aspect.

It is heartening that some progressive soil laboratories are coming to grips with the idea of examining biological fertility. Tests for soil CO₂ respiration, earthworm counts, bacteria and fungi mass, water soluble carbon etc. are now being done. A lot more of this for our farmers and in a manner that is simply accessible to them, is a huge possible guidance and help for them, as they leave soils better than what

they may have found them to be.....a legacy! Prudent to keep in mind that the soil mineral theory is a self fulfilling prophecy and which does not focus on the biological need of soils. There is a definite need to alter perceptions to look measure yield response in soil tests by looking at soil capability to produce CO₂. Through time the farmers will no doubt seek more and learn more.

A step, albeit small, is taken by the National Centre for Organic Farming (under Agriculture Ministry) recently by providing to growers microbes cultured to make use of as spray and soil application. Thus awareness is building up, but it needs to gather steam to rediscover mineral nutrition of soils from a perspective that balances and fosters microbial activity and diversity as per the saying : FEED THE SOIL!

Ashok Trivedi
Tea Farmer



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FARMING 3.0

SOWING THE SEEDS OF A PROSPEROUS FUTURE FOR INDIAN FARMERS

Technology has transformed our lives. It has had a far-reaching, disruptive impact that has upended convention and transformed not just the things we do, but how we do them.

Consider this – the world's largest ride-hailing company doesn't own a single car. The world's largest 'hotel chain', if you will, doesn't own a single hotel. Google and Apple could one day rival the world's biggest automakers as manufacturers of autonomous cars.

Technology can have a similarly disruptive and transformational impact

on Indian agriculture.

Granted, the examples I've cited above are of companies whose business models are technology-reliant. Agriculture is not as technologically intensive. Still, the adoption of technology could spur a whole new revolution and usher in an era of unprecedented productivity and prosperity.

The way things stand today, more than 60 percent of India's population draws its livelihood from agriculture and related activities. But, more than 80 percent of the country's farmers are small and marginal, the size of

their farms on average less than two hectares.

Due to this fragmentation, farmers do not have the wherewithal to modernise production or processing technology, nor use high yielding varieties of inputs like seeds and fertilisers. It's a vicious cycle of poor productivity and depressed incomes.

Added to this are complexities of government regulations and restrictions, inadequate infrastructure for transportation and storage distribution. All this affects the overall farm production and lowers the value of a farmer's produce.



The adoption of technology could break this cycle, unleashing the potential of India's farmlands and bringing prosperity to the country's farmers.

In many ways, it already is. Growing smartphone penetration is opening up new opportunities for farmers.

Amongst our various farmer oriented initiatives, Mahindra has recently launched a digital platform that offers farm related topical information that can be easily accessed through the increased use of smartphones amongst the farmer community. Our MyAgriGuru multi-lingual app acts as a 24X7 advisory platform which provides farmers essential real-time information like weather data, forecasts, mandi prices and the like, and at the same time allows them to interact with each other as well as agricultural experts. It keeps them equipped with the requisite knowledge, which helps farmers command better prices as well as look after their farms and produce better.

Another technology led initiative is our tractor rental service, Trringo. Whenever a farmer needs a tractor, he can simply rent one through this service, rather than invest in buying assets. This will help increase mechanization which will further enhance output levels and the overall income.

These are just two examples of the way technology is being used to improve productivity in agriculture, and two examples which I naturally am best acquainted with.

But while this is a start, it only just scratches the surface.

Imagine, for instance, a world where drones fly over fields gathering data, satellites measure acreage under cultivation, 'smart' farm equipment gauges weather, soil condition and the amount of water a certain crop requires.

Precision will become the name of the game as will efficiency, maximizing output while minimizing cost. Mobile-based applications will cut down red tape, cut out middlemen and shorten the supply chain, taking wasteful costs out of the system. The farmer will get the fair and full price for his



produce, while prices for the consumer will drop.

We call this paradigm shift Farming 3.0 and it is already underway. In this exciting new phase, India is actively moving towards innovative farming. Government as well as the private sector are leveraging this shift to bring in efficiencies by serving the farmers and customers in a more disintermediated way. We are seeing a lot of young entrepreneurs coming

up with start-ups and path-breaking ideas, challenging the traditional way of operating.

This phase is all about innovation, digital disruption and precision agriculture which will help the sector overcome the 'people', 'process' and 'technology' challenges that it currently grapples with.

I strongly believe that initiatives like the MyAgriGuru app which aim to reduce farmers' dependence on informal and unorganized players in terms of credit, inputs, advisory services or even market linkages, is going to be a critical factor in achieving the dream of Doubling Farmers' Income.

Farming 1.0, which began shortly after Independence and lasted until the mid-sixties, was characterised by sweeping land reforms. The second phase, or Farming 2.0 which commenced in the 1960s, was aimed at making India self-sufficient and 'food-secure'.

Just as it gave us bigger tractors, more seed varieties and better irrigation, the next giant leap forward in food production will be sustainable intensification of farming - doing more with less, on a bigger scale and with greater efficiency, which means precision agriculture will become a need. Technology is going to be a key enabler to bring about this revolution.



**Mr. Ashok Sharma, MD & CEO,
Mahindra Agri Solutions Ltd.**



UNIQUENESS THE STRENGTH OF KASHMIR SAFFRON

Kashmir Saffron is a regal spice of matchless aroma and is the costliest in the world. 1,60,000 flowers are needed to make one kilogram of pure saffron. The “golden spice” as it is known finds its use as a colouring and flavouring agent.

BELIEF ABOUT KASHMIR SAFFRON

Jammu and Kashmir State of India blessed with temperate climate is



Kashmir Saffron Pistil

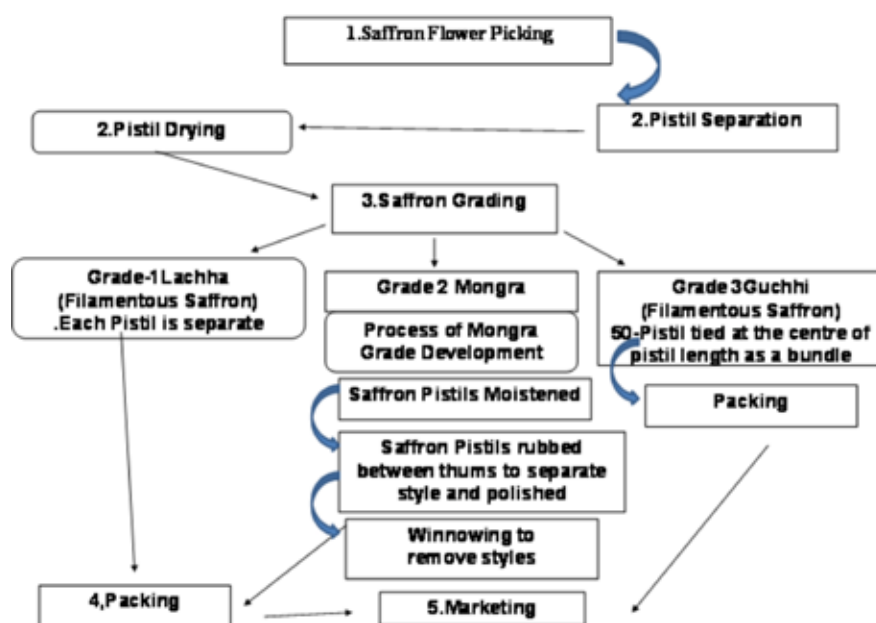


Iran Saffron Pistil

a unique state with distinction of producing quality saffron. A long history of saffron cultivation is revealed from historical records of Abul Fazl, Jehangir (Tuzuki Jehangir) and Ragatarangini. Saffron has been introduced by Shooq Bab Shaib- a local saint from Pampore who was the follower of sufi ascetics Khawja Masood wali (r.a) and Sheikh Sharif-uddin wali (r.a). who came to Kashmir as followers of Khawaja Amir Kabir Mir Syed Ali Hamdani (r.a) during 1372 AD. It is believed that a milkman from Pampore used to take cows for grazing to Zewan foothills and in between he would make the cows to drink water from a spring presently known as Takshak spring. On a surprise he would see that a snake from spring would milk the cows and for which he was sad. Shokbab sahab directed milkman to keep a bowl of rice on the spring as a feed for snake. Surprisingly next day the milk man could find some saffron corms in the bowl as a gift from god and thus became source of saffron cultivation in the Pampore area since then.

Primarily during Maharaja Partap Singh's reign, saffron in Kashmir was cultivated on 4 karewas of Tehsil Pampore viz; Bud wadur (Nadanwan, Khankabagh, prang, Gagar mool, Monghar, yashnambal, Androosa), Sonkrund wadur (Konibal, Namblabal, Dussu, Krenchoo, mugal khanun), Wattan Wadur (Chandhara, Lethpora) and Sambora Wadur (Resh Bagh, Badam Nar, Bangarkootpatal). Every saffron farmer was supposed to bring his produce of fresh saffron flowers to Mahal teng (Present day Frestibal) where Maharaja's contractor Mr Abdul Gani Wani would collect half of his produce as maliat tax from the farmer. And this practice of maliat tax in terms of kind was stopped after introduction of 1950's land to tiller act

In 1980'S saffron cultivation was further extended to new areas of District Budgam, Srinagar and Kishtwar, and at present saffron in Jammu & Kashmir is cultivated over more than 80 villages over 3715



hectares with an overall saffron production of 17 M.T. About 17000 farm families are associated with this farming system directly or indirectly. At the time of saffron introduction in new areas farmers would purchase equal weight of Pampore soil and corms for sowing because saffron farmers had created a myth that saffron cultivation is possible only in Pampore soils. However new research efforts under National Saffron Mission has revealed possibility of cultivating saffron in J&K over 12407 hectares with new potential areas of 6700

hectares besides traditional saffron area of 5400 hectares. With present productivity level of 4.5 kg/ha future saffron production in Jammu & Kashmir India is expected to rise to 55 M.T with an exchequer earning of Rs 825 Crores (127 Million US Dollars). \

UNIQUENESS OF KASHMIR SAFFRON

Uniqueness of Kashmir Saffron is well known in the world for its intrinsic high quality. This uniqueness is attributed to its specific geographical identity





and GXE Interaction.

i. Uniqueness on account of geographical differences.

Historically Iran, Kashmir, Spain and Greece are the major saffron producing countries of the world. Distinct geographical differences exist between Kashmir and other saffron producing countries of the world particularly for altitude, latitude and longitude leading to different type of climates. Kashmir observes temperate type of climate compared to arid type in Iran, continental Mediterranean in Spain and Humid Sub-Tropical climate in Greece. The geographical difference contributes to the uniqueness of Kashmir Saffron for quality and physical parameters for Pistil.

ii. Uniqueness on account of Physical & Quality Parameters of Kashmir Saffron

Post harvest practices of Kashmir saffron are legendary and are responsible for high saffron quality. Farmers from Kashmir pick fully opened flowers, whereas farmers from Kishtwar prefer to pick un-opened flowers.

a) Uniqueness for Physical Parameters of Saffron

The specific quality of Kashmir Saffron is linked to GX E interaction attributed to geographical identification. As a result of a favourable geo-agro-climatic situation, specific soil characteristics, plantation conditions, traditional human practises and a skilled local workforce Saffron pistil of Kashmir Saffron confirms wide variability for parameters related to flower development particularly stigma weight. On an average 1 kg of fresh saffron flowers in Iran yield 13.08g compared to 22g obtained under Kashmir conditions indicating heavier pistil leading to more saffron recovery which is a unique characteristic of Kashmir saffron.

UNIQUENESS FOR SAFFRON QUALITY:

The quality, reputation and characteristics of Saffron are essentially attributable to its geographical origin. Kashmir's saffron is known for its intrinsic quality characters, primarily because of its strong colour, bitterness and flavour as a result of high crocin

,picrocrocin & safranal content as expressed as direct reading of the absorbance at 440, 257 and 330 nm on dry basis). It is recognizable by its extremely dark maroon-purple hue which suggests saffron's strong flavour, aroma and colouring effect. A unique traditional process legendary to Kashmir is being carried for conversion of filamentous Lacha grade Kashmir saffron (Stigma with style) in to cut filamentous Mongra grade Kashmir Saffron (stigma only). The process ensures quality product with uniform carotenoid concentration throughout the length of stigma. Lacha grade Kashmir saffron (Stigma with Style) is brushed with hands to separate style from stigma followed by winnowing process for cleaning stigma from style. Kashmir saffron flower is a rich source of minerals. Stamens are rich source of ash, proteins, lipids, phosphorous, magnesium, potassium and Inositol, whereas, tepals are important source of reducing sugars, glucose, sucrose, maltose and mannitol.

Salwe Yasmin & F.A.Nehvi

Sher-e-Kashmir

**University of Agricultural Sciences
and Technology of Kashmir**

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MAPLE ORGTECH (INDIA) LIMITED

CONVERTING BACTERIAL WASTE TO USEFUL COMPOST

There exists magnificent bacteria working for growth and immunity of natural resources as well as human beings. Maple Orgtech (India) Ltd. classifies these as EM.1® bacteria. EM is effective Micro Organism and is devoid of any pathogenic microorganism that may be harmful for the environment or human beings. They are normally Lactic Acid Bacteria, Yeast, and Phototrophic Bacteria. EMs are anti-oxidant and anti-corrosive and hence increase the life and functionalities of plants and animals.

Way back in 1996 when his other business on Manufacturing was on to the rise, Mr. Madan Mohanka was surprised by the findings of Professor Dr. Teruo Higa on effective micro-organisms and specially the effectiveness EM product Bokashi. During 1962, Dr. Higa had made the claim that the use of EM will feed 10 billion more people and can even crop the desert areas. Nudged by the notion of sustainable eco-system and creating magic out of simple bacterial waste, Mr. Mohanka founded Maple Orgtech which first operated from Dehradun in way back 1996 but now has its head quarter in Kolkata. Bokashi, the wonder compost has widely been accepted among Indian cultivators and Maple's product authenticity and training goes a long way in making the compost material a signature product. Whether it is among the poultry farmers of Duttapukur, tea-planters of Darjeeling, Aqua-culturists and animal Husbandry of Dewas, Maple's Bokashi has gained trust and eminence since its inception. Composting out of rice – bran, molasses and organic waste, Bokashi is the activated and proliferated EM waste, which when mixed with other organic waste like kitchen scraps, enhance the speed and quality of composting. Bokashi is known to increase seed protein, crude

fat and yield in soya-bean and increased yield in fruits and vegetables. Bokashi is used to reduce the illness of disease inductive and disease suppressive soils along with increasing its fertilisation.

However, Maple Orgtech (India) Ltd has worked in propagating the philosophy of Dr. Higa much beyond than done by its overseas compatriots. Bokashi has not been restricted to agro-farming but has been applied to animal husbandry and aqua-culture as well. In animal and fish, bokashi increases the digestive function and fecundity which is a dream of every farmer. It keeps the animal healthy and out of ailing diseases. A talk with the users of Maple EM product will ensure that a beautiful, healthy, producing animal is the gift of EM technology.

Maple's EM technology works for agriculture, aqua-culture, animal husbandry, poultry, waste water treatment and solid waste management. Other than Bokashi Maple has propagated the product ranges to meet the growing demand for an all-round bio sustainable environment through organic products which are enriching for the environment and human beings.

Maple has sprawling company –owned garden and agriculture fields in Kolkata suburbs and Sikkim, the products are regularly tested to help ascertain their consistency of quality and output. The bio-tech laboratory at Samali plant of MM group, is a



Mr. Madan Mohanka
Chairman – MM Group

seat of continuous experiments and learning from where effective product solutions come out. The company website lists at least 15 uses of Effective Microorganism on the animal which takes Pashuamrut (nectar for animal) as its feed. The list of benefits is equally long with Aqua-magic, the wonderful organic solution for water treatment, pond treatment and feed additive for water borne creatures. The above mentioned products are but few and not limiting to the wide range of Maple EM products.

That the company has penetrated throughout India and even operating overseas, goes to the undaunted passion of the entrepreneur Mr. Mohanka and the robust sales team and dealer network that the company has grown over the years. Sales of EM is not easy because one has to percolate at the rural roots and make the farmers understand the technology of EM; tell them the right dose which will help to manure, giving the value for yield, time and money. One has to effectively let the dealers know the activation process of Bokashi and in what way it is going to make the difference. All these needs energized and educated staff members who are willing to come down to the soil. However the magic of Bokashi spreading around the world fast, Maple has a long and starry way to go.

Soma Chakraborty



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IOT & FOOD BLOCK CHAIN FOR POST HARVEST FOOD SUPPLY CHAIN



With the IoT Applications and advanced technology interventions in the Food and Agri Sector in India maturing at a quick pace, the sustainable technology implementations are becoming widespread to address complex issues like in the case of 'Food Grain Distribution Value Chain' - Right from the Source@Farm to retail 'Point of Sale & Consumption'. Especially for the organization of size and scale of operations like FCI (Food Corporation of India), McCain, Cargill etc... it is imperative to look at the end to end food-chain operations in this perspective.

What really IoT can do, is to address the respective challenges through-out the value chain of 'Post-Harvest'. And

what 'Block-Chain' can do, is to build on the top required 'Transparency' while the 'Ownership of Goods' exchange the hands. Thus accurately pinning the responsibility to the holder of food grain at a specified time within the chain before it moves to the next hand, including Transportation, Logistics & Storage.

This holistic approach, if adopted by the large corporates, will greatly help in conserving the food, by minimizing losses at every stage of Post-Harvest and build overall food security. The impact can be humongous! The reasoning and approach for building a cohesive system has been effectively illustrated in this article with the focus on adoption on the ground at the various stages of maturity.

Top 3 reasons of food grain

losses today are -

I) Loading & Unloading, II) Spoilage during Storage, III) Theft & Adulteration

Each of them can be dealt with by combining the technologies available in IoT & Block Chain in a way that is simpler & easy to adopt. However, that requires a due consideration to the activities and QA Process and the basic enablement through mechanization, physical equipments and tools.

Mechanization has been long existing. It's the first basic building block before we truly embark on this New-Age-Technology-Journey. But, the benefits offered by basic mechanization itself has been largely missing in the Food-Agri-Sector in India, pushing it back as many years on the Technology Adoption Curve. As a society, today, we have

a challenge here to stretch on both side, building the maturity as well as making technology adoption easy for the users. Else, it is difficult to unleash the benefits offered by IoT & Block Chain.

Here is an approach, with an attempt to lift the End-to-end Value chain of 'Post Harvest Food Distribution', which may help to solve myriads of challenges. Local Godowns needs to be strengthened with "IoT-Block-Chain- Grain-Bins" to enable farmer's adoption by providing these re-usable IoT Enabled BINs on Loan at Zero or minimal cost.

Stage-1: Mechanized Bin as Single Unit of Value for On-Farm Harvest, handling and storage.

One of the Bangalore based design startup has already addressed this - was featured in PM's 'Mann Ki Baat' and received an award for their invention, but virtually lost in the next step for commercial adoption. Such full-functional-mechanized Bin solves many problems together at one go: (1) Easy handling, Loading / Unloading by women workforce (majority in farm operation). (2) No Spillage / Wastage due to the very design of such BINs. (3) Bin act as a Single Unit of Value for Goods contained inside. (4) Stacking for Easy Transportation - on Tractor or Bullock-Kart. (5) Facilitated storage /retrieval Using Simple Rack & Chain-Pulley System at local godowns. - 1000's of Such Bins can be easily stacked on above another and without risk of "spoilage due to pressure and heat". Easy retrieval of individual Bins. (6) Ideal Denomination of Grain for distribution across the chain @ 200kg / 500kg / 1000Kg. (7) Enhanced Security Theft Identification and reducing the risk of losses / adulteration. (8) Lastly - Enabling the next level of IoT and Block Chain as required to trigger the Right Size Unit of Grain with its value stored.

Stage-2: IOT Enablement for On Farm QA and Market Price Linkage

- On Farm Extended Storage. Such IOT-GRAIN-BIN inbuilt with Insect Trap helps in extending on-farm storage life-span. In case of any pest attack, it is contained within the single BIN without spreading to whole stock.
- Kicking off the Block-chain @Unit Value of the BIN - IoT Enabled Camera Capture Grain Image for respective BIN and connected with Cloud-AI to provide the Grade, Variety and other measures for pricing.
- Connected with Commodity Exchange / Stock Prices - helps accurately encrypting the Value of Goods Stored in the BIN on the day of Harvest or As Shipped by Farmer from the Farm.
- Precise Geo-Based Location identification - both - while in transit and inside the warehouse for tracking & identification of individual BIN.
- Early alert of Spoilage & Pest Attack. IoT Sensors capturing the parameters on hourly / daily basis like CO2, Moisture, Temperature, Variety & Type of Grain, Pest Density Captured by Camera at the end of Insect Trap.

Stage-3: Block-Chain Enabled Process from Farm to Warehouse to Retail Stores

- Resulting in much higher income for Farmers, compared to today's practices. Balanced Negotiated Pricing based on Commodity Index and the Value of Goods on the date of Sale. Available - through stage-2 connected IoT above.
- Online Connected Banking - is already in place - for the LR Receipt based transfer to Farmer's bank account, which can be linked online with such system.
- Encryption of Grain Quality

parameters (as well as pricing parameters) at respective invoicing and change of ownership. Embedded in the IoT Based Device attached inside the BIN.

Stage-4: Connected AI(Artificial Intelligence) for Demand-Supply Based Logistics across State & Country.

The ultimate aim for food security point of view, is to achieve a National Intelligent Grain Supply System by FCI as envisioned above, with the precise knowledge of Individual BINs (location, variety, time of Harvest and Quality Condition, Health, Value etc...) can help in many ways : (a) Demand Based planning and Supply - reduced transportation and lead time as the nearest supply can be identified easily by the software. (b) Reduced Requirement of Storage at Central Warehouses. (c) Reduced Storage in the Heavy Bulky Systems, which requires costly maintenance and results in higher spoilage.

If in India, we want to truly achieve this, FCI like Organizations need to embrace the change, take a lead. Starting small through R&D budget of Product development - practically this is main reason for non-starter for the program of this nature to initiate in the first place, everything else is available within the system to make it happen. A Proof of concept and MVP has been worked out for implementation - if any organization sees a commercial point in this story - WELCOME!

Ravikishor Mundada
Leading the
AgriTech Innovation
initiative at
Nasscom Bangalore.
Supporting the
startup ideas
for Technology
Innovation in Food
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FARMER'S INCOME IS STILL A ZERO-SUM GAME

The farmer is the only man in our economy who buys everything at retail, sells everything at wholesale and pays the freight both ways- John F.Kennedy



The profit that the farmers make is more often than not a zero-sum game. Zero-sum game is a term commonly used in economics to indicate a win-lose game. In this game, a given resource is available only in a finite amount, meaning that someone has to lose in order for another to gain. The zero-sum game clearly describes the current situation of farmers, who are at the losing end for the rest of the nation's population to benefit from it.

Is there any guaranteed answer that farmers are getting good income from agriculture? The answer is a clear 'No'. Prior to independence, the barter or material exchange system has been a popular way for the farmers to realize profit from the agricultural commodities produced by them. Back in the fifteenth

century for instance, spices such as pepper were worth their weight in gold. Things have changed since independence especially in the arena of agricultural technologies. New technologies were invented and it shaped the future of agriculture. Yet, there is no price guarantee for an agricultural produce and unfortunately, the farmers can't fix their own price for the commodities they produce. In 1962, our noted economist and Nobel laureate Amartya Sen wrote about the aspects of Indian agriculture in the Economic Weekly (1962). He had emphasized three key points in this regard:

- When family labour employed in agriculture is given an "imputed value" in terms of the ruling wage rate, much of Indian agriculture seems unremunerative.

- By and large, the "profitability" of agriculture increases with the size of holding, "profitability" being measured by the surplus (or deficit) of output over costs including the imputed value of labour.
- By and large, productivity per acre decreases with the size of holding.

These three observations still hold true, especially the first one that clearly describes the current situation of our farmers. His conclusion that "profits" and "losses" over total costs including the cost of family labour valued at the market wage rate is barren seems to be realistic. This is just an example of how ideas relevant to one economic system when indiscriminately applied to another, produce quite absurd results.



Determination of zero and non-zero sum game

LIVELIHOOD OF FARMERS

The vast majority of our farmers' livelihoods depend only on farming. A farmer's lifestyle is therefore determined based on the income he/she makes on the farmland. Farmers are grouped into three categories based on the size of their holdings: small, medium and large. Most of the large farmers gain income from other businesses, in addition to their land, due to their high investment potential. However, farming is the only source of income for the small and medium size farmers due to a lack of access to surplus money that they could invest on allied business activities.

Let us consider a small farmer who owns two acres of land and cultivates high value crops such as banana and sugarcane. Banana requires much higher inputs and intensive management practices compared to sugarcane. Unpredictable weather conditions (drought, heavy wind) and price fluctuations may mean that the income from a banana crop can be highly variable, with sizable profits in one year and a net loss in another year. A small farmer does not have the ability to withstand such uncertainties as he/she has a family to support from this income. At the same time, large farmers are able to withstand such losses due to their economic capabilities and make profit from a routine cultivation of banana each year (spreading the risk across years). As a result, small farmers limit themselves to growing crops that ensure some income,

though low.

A different economic model has been implemented for crops such as sugarcane. The establishment of the Statutory Minimum Price (SMP) for sugarcane ensures a guaranteed income to the farmer's pocket. The farmers who grow sugarcane are thus immune from price fluctuations. The concept of establishing a Minimum Support Price (MSP) for agricultural commodities is highly beneficial to growers. Unfortunately, this is only available for select commodities and it is imperative that MSPs are implemented for all agricultural commodities. In our example, the small farmer who cultivates both banana and sugarcane will typically end up with a zero-sum game situation. Crop insurance can help recover some of these losses, but is not available for most crops in most areas. As a result, small farmers no longer find any interest in agriculture

and are vacating farmlands in search of better opportunities in nearby cities. Again, this situation is due to the zero-sum game nature of today's agricultural operations.

FARMER'S VOICE

India is an independent and democratic nation and everyone has the right to raise their concerns. Farmers must unite to make their voice heard. It is not for guarding a political post or showing heroism. The voice is for guarding their own life and to uplift their community. Most of the farmers that we interacted in Tamil Nadu have expressed that they need stable prices for their crop. One farmer, Mr. Kathirvel from Erode has indicated that the farmers should at the very least get back the money that they spent on crop inputs. In general economics, it is understood that the price of a commodity is dependent on the demand and supply balance. He raised a question on the discrepancies in the price of agricultural commodities and gold. He has been cultivating rice and turmeric in his field. In 2002, the average price per quintal of rice was Rs.1,200-1,500 when a sovereign of gold (8 g) was only Rs.1,500. Even you can't match the prices of paddy and gold. It's like in ladder distance.



Likewise in 2010, the average price of one quintal of turmeric was Rs.17,000-19,000 when the price of one sovereign gold was also at around Rs.20,000. Currently, the price of turmeric is down to Rs.10,000 and the price of gold is at Rs.23,000. We can justify that all prices are regulated by the demand-supply theory and gold is a scarce resource whereas the agricultural commodities are abundant. However, if we think about it critically, it does not make logical sense when food, an essential commodity for human survival is compared with gold, a less-used metal. We can live without gold, but not without food. Another farmer Mr. Elangovan from Thanjavur told me that 'today there are two important elements which farmers are most concerned about: monsoon and market'. According to him, the behavior of monsoon is erratic just as the behavior of the market. He also expressed that establishment of MSP for all crops will be vital.

REFLECTIONS ON THE NCF REPORT

The Government of India constituted the National Commission on Farmers (NCF) on November 18, 2004 under the chairmanship of Professor M.S. Swaminathan. The Terms of Reference reflected the priorities listed in the Common Minimum Programme. The NCF submitted five reports during the period of December 2004 to October 2006. These reports contain suggestions to achieve the goal of "faster and more inclusive growth" as envisaged in the Approach to the 11th Five Year Plan. Following are some of the key suggestions provided in the reports:

- A medium-term strategy for food and nutrition security in the country in order to move towards the goal of universal food security over time.
- Enhancing productivity, profitability, and sustainability of the major farming systems of the



country.

- Policy reforms to substantially increase flow of rural credit to all farmers.
- Special programmes for dryland farming for farmers in the arid and semi-arid regions, as well as for farmers in hilly and coastal areas.
- Enhancing the quality and cost competitiveness of farm commodities so as to make them globally competitive.
- Protecting farmers from imports when international prices fall sharply.
- Empowering elected local bodies to effectively conserve and improve the ecological foundations for sustainable agriculture.
- Among all, the most important recommendation was establishment of MSP for grains set at production cost plus 50% (C + 50), citing the need to safeguard the interests of small farmers and the increasing risk of taking up agriculture as a profession due to adverse incidents caused by climate change. So recently, union budget for 2018-19 ensures that

Minimum Support Price (MSP) for various agricultural crops will be 1.5 times more than the input cost. With this decision, present Government has fulfilled the most important promise made in its manifesto and to benefit for farmers.

URGENTLY NEEDED

There are certain things that require immediate and urgent attention. Our former Prime Minister Nehru quoted that 'Everything else can wait but not Agriculture'. So, it is the duty of our current government to safeguard the interests of our farmers by being more proactive on issues such as farmer's suicides, MSP for agricultural commodities, availability of credit at low interest rates, improving crop production and productivity, value addition, alternation of MGNREGA act, among others. The Government must take the necessary steps to implement policies recommended by the NCF committee led by Prof. M.S. Swaminathan. When these things can be overcome it's an easy one for the government to realize Prime Minister Modi's vision (i.e.) doubling of farmer's income by the year 2022.

Every doctor dreams that their children should become doctors and every engineer dreams their children to be engineers. However, no farmer would like their children to become a farmer. This situation clearly paints a picture on the current status of farmers and agriculture in India. However, as a son of a farmer myself, I would like to greet and applaud those farmers who support the nation's food security, though their life is a zero-sum game. India will become a truly developed country only when the farmers see agriculture as a leveled playing field where it is a win-win situation for all involved.

**S.Sarath, P.Naveenkumar and
M.Srinivasan
Tamil Nadu Agricultural University,
Coimbatore.**

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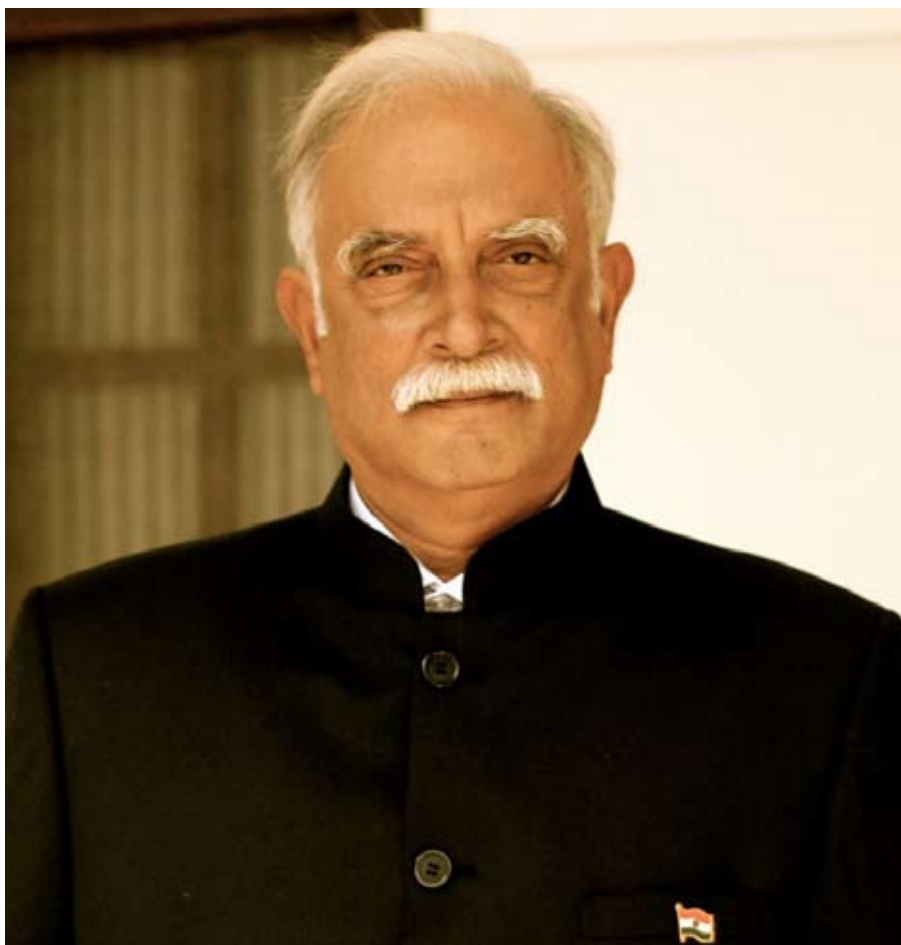
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Belonging to the royal family of Vizianagaram, Telugu Desam Party (TDP) MP, Ashok Gajapathi Raju Pusapati, a seven-time MLA in Andhra Pradesh, is the Union Minister for Civil Aviation in the Narendra Modi Government. He was a member of Andhra Pradesh State legislature for over twenty five years and was a Minister in the Govt. of A.P., for thirteen years holding the portfolios of Commercial Tax, Excise, Legislative affairs, Finance, Planning and Revenue.

Born on 26th June 1951, he is the younger son of the last Maharaja of Vizianagaram, Maharaja Pusapati Vijayarama Gajapathi Raju and Maharani Vidyavathi Devi. Educated at Scindia School, Gwalior; Lovedale School, Ooty; Hyderabad Public School, Hyderabad and V.S.Krishna College Visakhapatnam, his entry into politics was a natural process. He followed the footsteps of his father into politics. His father Dr.P V G Raju, Raja Saheb of Vizianagaram, was an ex-MP, who was in

FLYING HIGH

The royal scion of the erstwhile royal family of Vizianagaram, Ashok Gajapathi Raju Pusapati has been serving the Indian political scene for more than three decades. In various capacities, this political veteran has rendered his duties in the most honest manner. Despite royal upbringing, Raju is known for his humility and simplicity. A philanthropist, humanist and social activist, Ashok Gajapathi Raju Pusapati has set the bar higher for all the ministers.

public life for over 40 years. So was his brother Pusapati Ananda Gajapathi Raju.

His political initiation was part legacy and part his innate urge to change the deplorable condition of the people. Ashok was first elected to Andhra Pradesh Legislative Assembly in 1978 as a Janata Party candidate. He won from the Vizianagaram Vidhan Sabha constituency. Later when the Telugu Desam Party was formed in 1982 under the leadership of Telugu superstar and late Chief Minister N T Rama Rao, he joined the party. He was elected to the Assembly for the second time in 1983 and won subsequent elections in 1985, 1989, 1994 and 1999. During his political career spanning over 35 years, Raju had been a minister for excise and commercial taxes in the Cabinet of TDP founder N T Rama Rao. He held the portfolio of finance and legislative affairs during the Chief Ministership of Chandrababu Naidu. In 1989-90, he had also been the general secretary of TDP. Presently, Ashok is in the politburo of TDP. He had defeated YSR Congress candidate Venkata Swetha Chalapathi Kumara Krishna Rangarao Ravu by a margin of 1,06,911 votes. The only time he had lost an election was in 2004 but bounced back in 2009.

Ashok took an active part in the struggle for the formation of a new district viz., Vizianagaram. His interest to improve education in the district led to the establishment of several governmental and non-governmental educational institutions. Presently he is Chairman of a trust The Maharaja Alak Narayana Society of Arts and Science (MANSAS) which is running twelve educational institutions in the district. As a Minister, he was associated with several developmental activities. He is keenly interested in the field of public health and the conservation of water and electricity. In pursuance of this ideal, he launched housing, drinking water and health schemes. He has traveled abroad to study town planning and to implement it suitably in Andhra Pradesh.

Ashok Gajapathi Raju Pusapati is a humble man and do not avail the privileges entitled to him as a minister and instead prefers to travel



like a common man. At a time when members of Parliament (MP) are facing flak for availing extra facilities, the aviation minister is setting an example worth emulating by his colleagues. Raju, a Cabinet minister, has shunned the privileges he is entitled to while flying. Since taking charge as aviation minister, Raju has refused to use the air conditioned car from the terminal building to the aircraft that he is entitled to and instead travels in the airline ferry bus with other passengers. According to rules, even former aviation ministers who are still serving as Union Ministers are allowed to take the car right up to the aircraft at all airports in India. The minister carries his own luggage at the airport and stands in queue with other passengers for security checks. By virtue of being the country's aviation minister, Raju is exempted from security checks at domestic airports.

An honest minister who is keen to serve the people is a rarity these days. Ashok Gajapathi Raju Pusapati, has upheld the mantle of public service in the most honorable manner. He is an asset to the council of ministers.

“This budget is farmer friendly, common citizen friendly, business environment friendly and development friendly. It will add to ease of living. I congratulate the Finance Minister for the decision regarding MSP. I am sure it will help farmers tremendously”

NARENDRA MODI
Prime Minister



“What we are looking at is empowering the farmer through revamping the agricultural market and providing a favourable import-export duty structure apart from offering a minimum of 50% of profit margin on the cost of cultivation as basis for MSP.”

RADHA MOHAN SINGH
Union Agriculture Minister



“It is important to set up climate risk management R&D centres — at least one at every block level. Such centres should be supported by trained Climate Risk Managers, one woman and one man from each Panchayat.”

DR. MS SWAMINATHAN
Agriculture Expert and former Rajya Sabha Member



“Instead of increasing, farmers’ income has gone down. So, when we are talking of doubling it by 2022, I would say the last four years have been lost”

YASHWANT SINHA
Former Union Finance Minister



“I do believe organic farming is one of the right strategies that can be used to fight food insecurity, improve nutrition and alleviate poverty in India. In fact, the right approach to farming and non-farming activities could be the answer to economic migration.”

F HOUNGBO
President, International Fund for Agricultural development (IFAD)